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Energy, Mines and Resources Canada
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CANMET
Canada Centre for Mineral and Energy Technology
Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG0401 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle
Mine Evaluation Group

October 1982

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ENERGY RESEARCH PROGRAM
MINING RESEARCH LABORATORIES
DIVISION REPORT ERP/MRL 82-89(TR)

PROGRAM MEG0401 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG0401 is to sort drillhole data stored on computer cards or disk file. MEG0401 sorts MEG drillhole number, line number, intercalation number, sheet type and activity code in ascending order.

The results provided by MEG0401 can be directly read by MEG1000 and all other programs of the MEG0400 CADD series for the creation of a converted master file and for further data verification and correction.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

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GUIDE D'USAGER POUR LE PROGRAMME MEG0401
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG0401 est de trier les données de forage enregistrées sur cartes d'ordinateur ou sur disques. MEG0401 trie les numéros de forage MEG, les numéros de ligne, les numéros d'intercalation, le type des feuilles de codification et les codes d'activité, par ordre ascendant.

Le fichier de sortie de MEG0401 peut être lu directement par MEG1000 ou tous les autres programmes CADD de la série MEG0400 pour créer soit un nouveau fichier maître transformé ou soit pour en vérifier et corriger les données.

La documentation de ce programme est technique et peut avoir à subir des vérifications et être l'object de révision. Cependant, l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
00001           IDENTIFICATION DIVISION.
00002           PROGRAM-ID. MEG0401.
00003         *
00004         *
00005         *****************************************************************
00006         *                                                               *
00007         * GENERAL DESCRIPTION                                           *
00008         *                                                               *
00009         * THIS PROGRAM READS MEG CODED DRILLHOLE DATA STORED ON COMPUTER *
00010         * CARDS OR ON A DISK FILE AND SORTS IT IN ASCENDING ORDER USING  *
00011         * MEG DRILLHOLE NUMBER, LINE NUMBER, INTERCALATION, SHEET TYPE AND *
00012         * ACTIVITY CODE (SEE MEG CODING GUIDE). THIS PROGRAM HAS BEEN    *
00013         * WRITTEN IN COBOL LEVEL 4.7 AND WAS ORIGINALLY CREATED BY       *
00014         * JIRI FOLTA AND SUBSEQUENTLY MODIFIED BY RUSSELL BOYLE,         *
00015         * (EMR, CANMET, MRL), MAY, 1982.                                *
00016         *                                                               *
00017         *****************************************************************
00018         *
00019         *
00020         *****************************************************************
00021         *                                                               *
00022         * OPTIONS READ ON INPUT                                         *
00023         *                                                               *
00024         * CARD 1 CRP-SERIES,CRP-STARS,CARD-INPUT-D                      *
00025         *     COL 1-3  CRP-SERIES MEG SERIES                            *
00026         *     COL 4-7  CRP-STARS 4 ASTERIX ****                         *
00027         *     COL 8-11 CARD-INPUT-D OPTION TO READ UNSORTED MEG0401 DATA *
00028         *              EITHER FROM DISK FILE OR INPUT CARDS.            *
00029         *              BLANKS : DEFAULT DATA IS READ FROM CARDS.        *
00030         *              DISK   : DATA IS READ FROM DISK FILE.            *
00031         *                                                               *
00032         * CARD 2 TO EOF (END OF FILE) CRD-SERIES,CRD-SEQUENCE           *
00033         *     COL 1-3  CRD-SERIES MEG SERIES                            *
00034         *     COL 4-7  CRD-SEQUENCE MEG DRILLHOLE NUMBER                *
00035         *     COL 8-80 AS DEFINED IN THE MEG CODING GUIDE AND SHEETS.   *
00036         *              THE ACTIVITY CODE (COL 80) IS USED IN CONJUNCTION *
00037         *              WITH MEG0402.                                    *
00038         *                                                               *
00039         *****************************************************************
00040         *
00041         *
00042         *****************************************************************
00043         *                                                               *
00044         * FILES USED                                                    *
00045         *                                                               *
00046         *     DSKFTN   MEG DRILLHOLES SORTED DATA                       *
00047         *     DISKIN   INPUT MEG DRILLHOLES (REFER TO OPTION CARD-INPUT-D *
00048         *     DISK01   SCRATCH FILE USED TO STORE MEG UNSORTED DRILLHOLE *
00049         *              DATA                                             *
00050         *     SRTDSK   SCRATCH FILE USED FOR SORTING                    *
00051         *     INPUT    INPUT DATA OPTIONS AND/OR MEG DRILLHOLES (REFER TO *
00052         *              OPTION CARD-INPUT-D)                             *
00053         *     OUTPUT   OUTPUT LISTING REFER TO OUTPUT DISPOSITION       *
00054         *                                                               *
00055         *****************************************************************
00056         *
00057         *
```

```
00058          ******************************************************************
00059          *
00060          * DISPOSITION OF OUTPUT
00061          *
00062          *         SECTION 1 PRINTS THE INPUT PARAMETERS.
00063          *         SECTION 2 PRINTS ERRORS DETECTED BY MEG0401.
00064          *                   THIS SECTION IS ONLY PRINTED WHEN ERRORS
00065          *                   ARE DETECTED.
00066          *         SECTION 3 LISTING OF SORTED DATA AS STORED ON DISK FILE
00067          *         SECTION 4 PRINTS THE SUMMARY REPORT.
00068          *
00069          ******************************************************************
00070          *
00071          *
00072          ******************************************************************
00073          *
00074          * EXECUTION
00075          *
00076          *     H0401,CM70000,T100,IO300,P2.
00077          *     ACCOUNT,******.
00078          *     ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=****,MR=1.
00079          *     BEGIN,CADD,PROCD,PROGRAMIN=MEG0401,
00080          *     PFNI=PERMANENT FILE NAME INPUT,
00081          *        PFNI IS ONLY REQUIRED WHEN UNSORTED DATA ARE STORED
00082          *        ON DISK FILE (REFER TO OPTION CARD-INPUT-D).
00083          *     PFNO=PERMANENT FILE NAME OUTPUT.
00084          *        PFNO REPRESENTS THE FILE NAME OF SORTED DATA.
00085          *        THIS FILE NAME IS COMPULSORY.
00086          *
00087          ******************************************************************
00088          *
00089          *
00090           ENVIRONMENT DIVISION.
00091           CONFIGURATION SECTION.
00092           SOURCE-COMPUTER. CYBER 730.
00093           OBJECT-COMPUTER. CYBER 730.
00094           SPECIAL-NAMES.   CONSOLE IS CONSOLE.
00095           INPUT-OUTPUT SECTION.
00096           FILE-CONTROL.
00097               SELECT OTPT-FILE ASSIGN TO DSKFTN-FZ.
00098               SELECT CARD-FILE ASSIGN TO INPUT.
00099               SELECT DISK-FILE ASSIGN TO DISKIN-FZ.
00100               SELECT PRNT-FILE ASSIGN TO OUTPUT.
00101               SELECT TRAN-FILE ASSIGN TO DISK01.
00102               SELECT SORT-FILE ASSIGN TO SRTDSK.
00103           DATA DIVISION.
00104           FILE SECTION.
00105           FD  CARD-FILE
00106               LABEL RECORDS ARE OMITTED.
00107           01  CARD-RECORD.
00108               02  CR-PARAMETERS.
00109                   03  CRP-IDENT.
00110                       05  CRP-SERIES  PIC XXX.
00111                       05  CRP-STARS   PIC XXXX.
00112                       05  CRP-INPUT   PIC XXXX.
00113                   03  FILLER          PIC X(69).
00114               02  CR-DATA REDEFINES CR-PARAMETERS.
```

CHAPTER 2.0
BLANK OPTION CARD SHEET(S)

MEG0401 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1

CRP-SERIES	CRP-STARS	CRP-INPUT-D
1 2 3	4 — 7	8 — 11

CARD NO. 2 TO EØF (MEG CODED DRILL-HOLE DATA)

CRD-SERIES	CRD-SEQUENC	CRD-SHEET-TYPE	CRD-LINE-NR/CRD-LINE-NR-X	CRP-INTER-CAL/CAL-X		CRP-ACT-CØDE
1 2 3	4 — 7	8	9 10 11	12	13 — 79	80
					X(67)	

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0401,
PFNI=                              , (PERMANENT FILE NAME OF INPUT FILE (UNSORTED DATA)).
PFNØ=                              . (PERMANENT FILE NAME OF OUTPUT FILE (MEG0401)).
```

CHAPTER 3.0
EXECUTION OF THE PROGRAM WITH TEST DATA

MEG0401 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R. Boyle

CARD NO. 1

CRP-SERIES	CRP-STARS	CRP-INPUT-D
1 2 3	4 — 7	8 — 11
ZZX	****	DISK

CARD NO. 2 TO EØF (MEG CODED DRILL-HOLE DATA)

CRD-SERIES	CRD-SEQUENC	CRD-SHEET-TYPE	CRD-LINE-NR/CRD-LINE-NR-X	CRP-INTER-CAL/CAL-X		CRP-ACT-CØDE
1 2 3	4 — 7	8	9 10 11	12	13 — 79	80
					X(67)	

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0401,
PFNI= MEG0401ZZXUNSORT        , (PERMANENT FILE NAME OF INPUT FILE (UNSORTED DATA)).
PFNØ= MEG0401ZZXSORT          . (PERMANENT FILE NAME OF OUTPUT FILE (MEG0401)).
```

SECTION -1- OPTIONS APPLIED

R0401 MEG0401 INITIAL EDIT AND SORT OF INPUT DATA FOR MINE SERIES RUN DATE 09/09/82 PAGE 1

CARD	OPTION		DESCRIPTION
1	CRP-SERIES	ZZX	MEG SERIES
	CRP-STARS	****	4 ASTERIX
	CRP-INPUT	DISK	INPUT DATA OPTION
			BLANKED INPUT DATA ON CARDS
			DISK INPUT DATA ON FILE PFNI

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SECTION -2- ERRORS

R0401 MEG0401 INITIAL EDIT AND SORT OF INPUT DATA FOR MINE SERIES ZZX RUN DATE 09/09/82 PAGE 2

CARD NO.	DATA CARD 12345678901234567890123456789012345678901234567890123456789012345678901234567890	ERROR MESSAGE
1	ZZX**** ****	INVALID SEQUENCE NR.

6

SECTION -3- LISTING OF SORTED DATA


```
ZZX****
ZZX0009   1     X15       112                    63 1935.0 1557255590912591209
ZZX0009   2 C  19720   2590   1152                      BWG     BW 20.0
ZZX0009   3  SURFACE HOLE
ZZX0009   4      0.0      -55.0      60.0
ZZX0009   5    500.0      -49.0      37.0
ZZX0009   6   1000.0      -64.0      35.0
ZZX0009   7   1500.0      -45.0      44.0
ZZX0009   8   1740.0      -42.0      37.0
ZZX0009   9   1935.0      -64.0      53.0
ZZX0009A001             4   20.0 480.0        WW 2         90      2.67
ZZX0009B001
ZZX0009A0011            0    0.0  20.0        WW X          0      2.67
ZZX0009B0011
ZZX0009A002             4  500.0 500.0        WW 2         90      2.67
ZZX0009B002
ZZX0009A003             4 1000.0 500.0        WW 2         90      2.67
ZZX0009B003
ZZX0009A004             4 1500.0 127.5        WW 2         90      2.67
ZZX0009B004
ZZX0009A005             4 1627.5   4.2         W C   H     -1      2.67
ZZX0009B005
ZZX0009A006             4 1631.7  81.4         W B V B     -1      2.67
ZZX0009B006
ZZX0009A007             4 1713.1   6.9         W C S J     -1      2.67
ZZX0009B007
ZZX0009A008  1595       4 1720.0   5.0         M C S J     -1      2.67
ZZX0009B008           S 0.162
ZZX0009A009  1596       4 1725.0   1.4         M C S J     -1      2.67
ZZX0009B009           S 0.032
ZZX0009A010  1597       4 1726.4   5.0         M C S J     -1      2.67
ZZX0009B010           S 0.178
ZZX0009A011  1598       4 1731.4   3.6         M C S J     -1      2.67
ZZX0009B011           S 0.227
ZZX0009A012  1599       4 1735.0   5.0         M C S J     -1      2.67
ZZX0009B012           S 0.146
ZZX0009A013             4 1740.0  10.8         W C S J     -1      2.67
ZZX0009B013
ZZX0009A014             4 1750.8 184.2         W B S P     -1      2.67
ZZX0009B014
ZZX0038   1   770322      112                    12   60.5 20601707710157710l5
ZZX0038   2 C 7600.0 8540.0 1210.5                    AAT
ZZX0038   3  UNDERGROUND HOLE , 200 LEVEL , K ZONE
ZZX0038A001             3    0.0   2.8  0180  K          -1      2.67
ZZX0038B001 ES1    56C          36C          8
ZZX0038A002   32-1      3    2.8   3.8  0180  K          -1      2.67
ZZX0038B002 ES1   280S 0.078  182C          38
ZZX0038A003   32-2      3    6.6   2.1  0180  K          -1      2.67
ZZX0038B003 ES1   813S 0.243  528C         111
ZZX0038A004   32-3      3    8.7   2.8  0180  K          -1      2.67
ZZX0038B004 ES1  1654S 0.393 1105S 0.083  226
ZZX0038A005   32-4      3   11.5   2.3  0180  K          -1      2.67
ZZX0038B005 ES1  2519S 0.462 1637C          343
ZZX0038A006   32-5      3   13.8   2.5  0180  K          -1      2.67
ZZX0038B006 ES1   721S 0.217  469C          98
```

```
ZZX0038B007 ES1   680S 0.215  442C          93
ZZX0038A008   32-7      3   20.0   1.8  0180  K          -1      2.67
ZZX0038B008 ES1   525S 0.183  341S 0.038   72
ZZX0038A009   32-8      3   21.8   0.5  0180  K          -1      2.67
ZZX0038B009 ES1   507S 0.183  330C          69
ZZX0038A010   32-9      3   22.3   1.2  0180  K          -1      2.67
ZZX0038B010 ES1  2623S 0.468 1705C         358
ZZX0038A011  32-10      3   23.5   1.5  0180  K          -1      2.67
ZZX0038B011 FS1    75S 0.008   49C          10
ZZX0038A012  32-11      3   25.0   1.7  0180  K          -1      2.67
ZZX0038B012 ES1   527S 0.154  343S 0.032   72
ZZX0038A013  32-12      3   26.7   1.3  0180  K          -1      2.67
ZZX0038B013 ES1   538S 0.154  350C          74
ZZX0038A014  32-13      3   28.0   0.9  0180             -1      2.67
ZZX0038B014 ES1   190S 0.049  124C          26
ZZX0038A015  32-14      3   28.9   1.1  0180             -1      2.67
ZZX0038B015 ES1   182S 0.049  118C          25
ZZX0038A016  32-15      3   30.0   1.8  0180             -1      2.67
ZZX0038B016 ES1   320S 0.087  208S 0.018   44
ZZX0038A017  32-16      3   31.8   1.7  0180             -1      2.67
ZZX0038B017 ES1   125S 0.031   81C          17
ZZX0038A018             3   33.5   1.2  0180             -1      2.67
ZZX0038B018 ES1    32C          0C           0
ZZX0038A019             3   34.7   3.6  0180             -1      2.67
ZZX0038B019 ES1     5C          0C           0
ZZX0038A020             3   38.3  22.2  0180             -1      2.67
ZZX0038B020 ES1     0C          0C           0
ZZX0039   1   77033       112 09             12  183.8 3860170771015771015
ZZX0039   2 C 7600.0 8551.7 1210.5                    AXT
ZZX0039   3  K + P ZONES , 11.7 FEET MINED-OUT
ZZX0039A001             1    0.0    5.0  0180  K        M-1      2.67
ZZX0039B001           B 0.148                      D0.099
ZZX0039A002             1    5.0    6.7  0180  K        M-1      2.67
ZZX0039B002           B 0.123                      D0.082
ZZX0039A003  33-1       3    0.0    3.3  0360  K          -1      2.67
ZZX0039B003           B0.1213                      D0.081
ZZX0039A004  33-2       3    3.3    1.7  0360  K          -1      2.67
ZZX0039B004           B00.052                      D0.035
ZZX0039A005  33-3       3    5.0    2.2  0360  K          -1      2.67
ZZX0039B005           B00.308                      D0.205
ZZX0039A006  33-4       3    7.2    2.1  0360  K          -1      2.67
ZZX0039B006           B00.297                      D0.198
ZZX0039A007  33-5       3    9.3    1.7  0360             -1      2.67
ZZX0039B007           B00.064                      D0.042
ZZX0039A008             3   11.0    9.0  0360             -1      2.67
ZZX0039B008           0                            0
ZZX0039A009  33-6       3   20.0    1.6  0360             -1      2.67
ZZX0039B009           B 0.021                      D0.014
ZZX0039A010  33-7       3   21.6    2.1  0360             -1      2.67
ZZX0039B010           B 0.098                      D0.065
ZZX0039A011  33-8       3   23.7    1.1  0360             -1      2.67
ZZX0039B011           B 0.028                      D0.019
ZZX0039A012             3   24.8    3.2  0360             -1      2.67
ZZX0039B012           0                            0
ZZX0039A013             3   28.0    0.3  0360             -1      2.67
ZZX0039B013           0                            0
ZZX0039A014             3   28.3   16.3  0360             -1      2.67
ZZX0039B014           0                            0
ZZX0039A015             3   44.6    4.5  0360             -1      2.67
ZZX0039B015           0                            0
ZZX0039A016             3   49.1    0.8  0360             -1      2.67
ZZX0039B016           0                            0
ZZX0039A017             3   49.9    1.3  0360             -1      2.67
ZZX0039B017           0                            0
ZZX0039A018             3   51.2   11.0  0360             -1      2.67
```

ZZX0039B019		B	0.046				D0.030		
ZZX0039A020	33-10		3	64.1	0.8	0360	P	-1	2.67
ZZX00398020		B	0.438				D0.292		
ZZX0039A021			3	64.9	1.6	0360	P	-1	2.67
ZZX00398021		0					0		
ZZX0039A022	33-11		3	66.5	0.8	0360	P	-1	2.67
ZZX00398022		B	0.276				D0.184		
ZZX0039A023			3	67.3	3.5	0360	P	-1	2.67
ZZX00398023		0					0		
ZZX0039A024	33-12		3	70.8	1.7	0360	P	-1	2.67
ZZX00398024		B	0.196				D0.131		
ZZX0039A025	33-12		3	72.5	1.6	0360	P	-1	2.67
ZZX00398025		B	0.196				D0.131		
ZZX0039A026	33-12		3	74.1	0.9	0360	P	-1	2.67
ZZX00398026		B	0.198				D0.131		
ZZX0039A027			3	75.0	1.7	0360	P	-1	2.67
ZZX00398027		0					0		
ZZX0039A028	33-13		3	76.7	0.9	0360	P	-1	2.67
ZZX00398028		B	0.005				D0.003		
ZZX0039A029	33-14		3	77.6	2.4	0360	P	-1	2.67
ZZX00398029		B	0.634				D0.422		
ZZX0039A030	33-15		3	80.0	2.9	0360	P	-1	2.67
ZZX00398030		B	0.616				D0.411		
ZZX0039A031	33-16		3	82.9	1.2	0360	P	-1	2.67
ZZX00398031		B	0.217				D0.145		
ZZX0039A032	33-17		3	84.1	1.4	0360		-1	2.67
ZZX00398032		B	0.034				D0.022		
ZZX0039A033			3	85.5	47.2	0360		-1	2.67
ZZX00398033		0					0		
ZZX0039A034	33-18		3	132.7	2.9	0360		-1	2.67
ZZX00398034		B	0.061				D0.041		
ZZX0039A035			3	135.6	13.9	0360		-1	2.67
ZZX00398035		0					0		
ZZX0039A036			0	149.5	1.6	0360		0	2.67
ZZX00398036		0					0		
ZZX0039A037			3	151.1	3.9	0360		-1	2.67
ZZX00398037		0					0		
ZZX0039A038			3	155.0	7.1	0360		-1	2.67
ZZX00398038		0					0		

SECTION -4- SUMMARY

R0401 MEG0401 INITIAL EDIT AND SORT OF INPUT DATA FOR MINE SERIES ZZx RUN DATE 09/09/82 PAGE 4

CARDS READ	162
CARDS ACCEPTED	161
CARDS REJECTED	1

REFERENCES

1. Sabourin, R.L., "Guide for coding drill hole data from uranium deposits - Version 3"; Division Report ERP/MRL 82-63(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

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Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

1. Au meilleur de la connaissance des auteurs, les programmes d'ordinateur des systèmes CADD et GEM opéreront comme ils sont présentés, mais ni les auteurs, ni le CANMET n'offrent de garantie, expressément ou implicitement, quant à l'état complet de la documentation ou à la performance du programme.

2. Les programmes d'ordinateur des systèmes CADD et GEM sont écrits en FORTRAN (CDC, Level 4.8) et COBOL (CDC, Level 4.7). Le CANMET ne garantit pas que ces programmes peuvent être passés sur n'importe quel ordinateur sans effectuer des transformations.

3. Les programmes d'ordinateur de systèmes CADD et GEM sont protégés en vertu du droit d'auteur de la Couronne.

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Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

CANMET
Canada Centre for Mineral and Energy Technology
Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG0402 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle
Mine Evaluation Group

October 1982

This document is an unedited **interim report** prepared primarily **for** discussion and internal **reporting** purposes. It does not represent a final exp[illegible] the opinion of the [illegible] for Mineral and Energy [illegible] **(CANMET)**

Ce document est un rapport [illegible] non-révisé et rédigé [illegible] principalement pour fin de discussion et de documentation interne. Il ne représente nullement l'opinion définitive de [illegible] du Centre canadien de la technologie des minéraux et de l'énergie (CANMET)

ENERGY RESEARCH PROGRAM
MINING RESEARCH LABORATORIES
DIVISION REPORT ERP/MRL 82-90(TR)

PROGRAM MEG0402 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG0402 is to update an old MEG0401 master file using a correction file and possibly merge it to another MEG0401 master file. The program optionally uses up to three input files: an old MEG0401 master file of sorted drillholes, a sorted MEG0401 correction file and a MEG0401 merge file. MEG0402 will create a file known as the new master file. This file is similar to a MEG0401 output file.

The correction file allows the users to insert, delete and modify existing records or delete all the records of a drillhole. Th average file allows the user to add more drillholes to the old MEG0401 master file.

The documentation at this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG0402
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG0402 est la mise à jour d'un vieux fichier maître MEG0401 en utilisant un fichier de correction et possiblement en le combinant à un autre fichier maître MEG0401. Le programme peut optionnellement utiliser jusqu'à trois fichiers d'entrées: un vieux fichier maître MEG0401 contenant des données triées, un fichier de MEG0401 contenant uniquement les corrections triées et un fichier de MEG0401 "merge" contenant les données de nouveaux forages à être combinées au vieux fichier maître MEG0401. MEG0402 créera un fichier qui protera le nom de nouveau fichier maître, et qui sera semblable à un fichier de sortie de MEG0401. Le fichier de correction permet à l'utilisateur d'insérer, de retrancher et de modifier des records existant ou de retrancher tous les records d'un forage. Le fichier "merge" permet à l'utilisateur d'ajouter des données de forage au vieux fichier maître MEG0401.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

---

*Programmeur, Laboratoires de recherches minières, Centre canadien de la technologie des minéraux et de l'énergie (CANMET), Energie, Mines et Ressources, Canada, Ottawa.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
00001            IDENTIFICATION DIVISION.
00002            PROGRAM-ID. MEG0402.
00003           *
00004           *
00005           ************************************************************
00006           *                                                          *
00007           *GENERAL DESCRIPTION                                       *
00008           *                                                          *
00009           * PROGRAM MEG0402 IS USED TO UPDATE AND/OR MERGE A MEG0401 OLD *
00010           * MASTER FILE. FOUR FILES CAN BE USED WHEN EXECUTING MEG0402.  *
00011           * THE OLD MASTER FILE IS REPRESENTED BY TAPE1. THE UPDATA IS DONE*
00012           * USING TAPE3 WHICH CONTAINS SORTED CORRECTIONS TO BE MADE TO  *
00013           * ACTIVITY CODE (D, I, R) LOCATED IN COLUMN 80 . MERGING IS    *
00014           * PERFORMED BY USING TAPE2 WHICH CONTAINS DRILL-HOLES DATA TO BE *
00015           * ADDED TO THE OLD MASTER FILE. THE UPDATED AND/OR MERGED FILE IS*
00016           * STORED ON TAPE4 THE NEW MASTER FILE. THIS PROGRAM HAS BEEN   *
00017           * WRITTEN IN CDC COBOL LEVEL 4.7 AND WAS ORIGINALLY CREATED    *
00018           * BY JIRI FOLTA AND SUBSEQUENTLY MODIFIED BY RUSSELL BOYLE.    *
00019           * (EMR, CANMET, MRL), MAY, 1982.                             *
00020           *                                                          *
00021           ************************************************************
00022           *
00023           *
00024           ************************************************************
00025           *                                                          *
00026           *OPTIONS READ ON INPUT                                     *
00027           *                                                          *
00028           *    CARD 1 CIR-SERIES,CIR-STARS                           *
00029           *        COL 1-3  CIR-SERIES MEG SERIES                    *
00030           *        COL 4-7  CIR-STARS 4 ASTERIX ****                 *
00031           *                                                          *
00032           ************************************************************
00033           *
00034           *
00035           ************************************************************
00036           *                                                          *
00037           *FILES USED                                                *
00038           *                                                          *
00039           *        TAPE1 SORTED OLD MASTER FILE MEG0401 (COMPULSORY).*
00040           *              TAPE1 WILL BE UPDATED FROM TAPE3 AND/OR MERGED*
00041           *              WITH TAPE2 GIVING TAPE4.                    *
00042           *        TAPE2 SORTED MASTER FILE TO BE MERGED WITH THE UPDATED*
00043           *              MASTER FILE (OPTIONAL).                     *
00044           *        TAPE3 SORTED CORRECTIONS FILE (OPTIONAL). CORRECTIONS*
00045           *               WITH RESPECTIVE ACTIVITY CODE ARE STORED ON TAPE3*
00046           *              THE ACTIVITY CODE IS ONE OF I, D, R AS DEFINED*
00047           *              BELOW AND SHOULD BE SPECIFIED IN COL 80.    *
00048           *                I-INSERT -ONE RECORD (CARD) IS INSERTED AT*
00049           *                         LOCATION DEFINED BY THE MEG SERIES,*
00050           *                         HOLE NUMBER, SHEET TYPE, LINE NUMBER*
00051           *                         (OR TITLE SHEET NUMBER) AND     *
00052           *                         INTERCALATION NUMBER.           *
00053           *                D-DELETE -ONE RECORD IS DELETED AT LOCATION...*
00054           *                R-REPLACE-SPECIFIED NONE BLANKED VARIABLES ARE*
00055           *                         REPLACED AT LOCATION...         *
00056           *              VARIABLES CAN BE BLANKED BY SPECIFYING ASTERIX*
00057           *              **...*** IN IT S FIELD AND AN ACTIVITY CODE OF*
```

```
00058           *               R IN COLUMN 80.                                 *
00059           *               AN ACTIVITY CODE OF D ON A TITLE CARD I WILL    *
00060           *               CAUSE A COMPLETE DRILL-HOLE TO BE DELETED.      *
00061           *               AN ACTIVITY CODE OF I ON A TITLE CARD I WILL    *
00062           *               CAUSE A COMPLETE DRILL-HOLE TO BE INSERTED.     *
00063           *         TAPE4  NEW MASTER FILE (UPDATED AND/OR MERGED VERSION). *
00064           *         OUTPUT LISTING                                          *
00065           *                SECTION 1 ERRORS AND WARNINGS OF FILES.          *
00066           *                SECTION 2 INPUT PARAMETER CARD.                  *
00067           *                SECTION 3 SUMMARY OF MODIFICATIONS.              *
00068           *                                                                 *
00069           *******************************************************************
00070           *
00071           *
00072           *******************************************************************
00073           *                                                                 *
00074           * EXECUTION                                                       *
00075           *                                                                 *
00076           *                H0402,CM70000,T200,I0400,P2.                     *
00077           *                ACCOUNT,*****.                                   *
00078           *                ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=****,MR=1.  *
00079           *                BEGIN,CADD,PROCD,                                *
00080           *                PROGRAMIN=MEG0402,                               *
00081           *                PFNI = PERMANENT FILE NAME OF TAPE1,             *
00082           *                PFNI2= PERMANENT FILE NAME OF TAPE2,             *
00083           *                PFNI3= PERMANENT FILE NAME OF TAPE3,             *
00084           *                PFNO = PERMANENT FILE NAME OF TAPE4.             *
00085           *                                                                 *
00086           *******************************************************************
00087           *
00088           *
00089            ENVIRONMENT DIVISION.
00090            CONFIGURATION SECTION.
00091            SOURCE-COMPUTER. CYBER 730.
00092            OBJECT-COMPUTER. CYBER 730.
00093            SPECIAL-NAMES.   CONSOLE IS CONSOLE.
00094            INPUT-OUTPUT SECTION.
00095            FILE-CONTROL.
00096                SELECT CARD-IN  ASSIGN TO INPUT.
00097                SELECT PRNT-OUT ASSIGN TO OUTPUT.
00098                SELECT MSTR-IN1 ASSIGN TO TAPE1-FZ.
00099                SELECT MSTR-IN2 ASSIGN TO TAPE2-FZ.
00100                SELECT UPDT-IN  ASSIGN TO TAPE3-FZ.
00101                SELECT MSTR-OUT ASSIGN TO TAPE4-FZ.
00102            DATA DIVISION.
00103            FILE SECTION.
00104            FD  CARD-IN
00105                LABEL RECORDS ARE OMITTED.
00106            01  CI-RECORD.
00107                03  CIR-SERIES          PIC XXX.
00108                03  CIR-STARS           PIC XXXX.
00109                03  FILLER              PIC X(73).
00110            FD  PRNT-OUT
00111                LABEL RECORDS ARE OMITTED.
00112            01  PO-RECORD               PIC X(137).
00113            FD  MSTR-IN1
00114                LABEL RECORDS ARE OMITTED.
```

CHAPTER 2.0

BLANK OPTION CARD SHEET(S)

MEG0402 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1

CIR-SERIES CIR-STARS

1 2 3 | 4 — 7

5

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0402,
PFNI=                          , (PERMANENT FILE NAME OF MEG0401 TO BE CORRECTED (TAPE 1))
PFNI2=                         , (PERMANENT FILE NAME OF MEG0401 TO BE SORTED (TAPE 2))
PFNI3=                         , (PERMANENT FILE NAME OF MEG0401 CORRECTIONS (TAPE 3))
PFNIØ=                         . (PERMANENT FILE NAME OUTPUT MEG0402 (TAPE 4))
```

CHAPTER 3.0

EXECUTION OF THE PROGRAM WITH TEST DATA

MEG0402 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R Boyle

CARD NO. 1

CIR-SERIES CIR-STARS

1	2	3	4	—	7
Z	Z	X	*	*	*	*

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0402,
PFNI= MEG0401ZZXSORT          , (PERMANENT FILE NAME OF MEG0401 TO BE CORRECTED (TAPE 1))
PFNI2= -                      , (PERMANENT FILE NAME OF MEG0401 TO BE SORTED (TAPE 2))
PFNI3= MEG0401ZZXCOR1         , (PERMANENT FILE NAME OF MEG0401 CORRECTIONS (TAPE 3))
PFNI0= MEG0401ZZXSORTV2       . (PERMANENT FILE NAME OUTPUT MEG0402 (TAPE 4))
```

SECTION -1- ERRORS + WARNINGS

R0402 MEG0402 TAPE MERGE AND/OR UPDATE SERIES ZZX DATE 09/09/82

TAPE1 BEING PROCESSED

*****WARNING - NO DATA ON TAPE2

TAPE3 BEING PROCESSED

SECTION -2- OPTION APPLIED

R0402 MEG0402 TAPE MERGE AND/OR UPDATE SERIES ZZX DATE 09/09/82

CARD			DESCRIPTION
1	CIR-SERIES	ZZX	MEG SERIES
	CIR-STARS	****	STARS ****

SECTION -3- SUMMARY

R0402 MEG0402 TAPE MERGE AND/OR UPDATE SERIES ZZX DATE 09/09/82

HOLES ON TAPE1	3
RECORDS ON TAPE1	161
HOLES ON TAPE2	0
RECORDS ON TAPE2	0
RECORDS ON TAPE3	2
HOLES ON TAPE1 DELETED	0
RECORDS ON TAPE1 DELETED	0
HOLES ON TAPE2 DELETED	0
RECORDS ON TAPE2 DELETED	0
HOLES INSERTED	0
RECORDS INSERTED	0
HOLES WRITTEN	3
RECORDS WRITTEN	161
TAPE1 RECORDS UNCHANGED	159
TAPE2 RECORDS UNCHANGED	0
TAPE1 RECORDS MODIFIED	2
TAPE2 RECORDS MODIFIED	0

REFERENCES

1. Boyle, R., "Program MEG0401 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-89(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

---

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

---

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Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
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K1A 0G1
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2. Les programmes d'ordinateur des systèmes CADD et GEM sont écrits en FORTRAN (CDC, Level 4.8) et COBOL (CDC, Level 4.7). Le CANMET ne garantit pas que ces programmes peuvent être passés sur n'importe quel ordinateur sans effectuer des transformations.

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CANMET

Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG0403 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle

Mine Evaluation Group

October 1982

This document is an unedited interim report prepared primarily for discussion and internal reporting purposes. It does not represent a final expression of the opinion of the Canada Centre for Mineral and Energy Technology (CANMET)

Ce document est un rapport [illegible] préparé et rédigé [illegible] pour fin de discussion et de documentation [illegible] ne représente aucune façon l'opinion définitive du [illegible] Centre canadien de la technologie des minéraux et de l'énergie (CANMET)

ENERGY RESEARCH PROGRAM

MINING RESEARCH LABORATORIES

DIVISION REPORT ERP/MRL 82-91(TR)

PROGRAM MEG0403 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG0403 is to create a file of selected MEG drillhole data. An old MEG0401 master file is checked out against drillhole numbers specified in ascending order by the user. The selected drillhole information is optionally printed by MEG0403.

The input file of the program is provided by MEG0401. The output file is also similar to a MEG0401 file.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG0403
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG0403 est de créer un fichier contenant les données des forages choisis. Les numéros de forage d'un fichier maître MEG0401 sont comparés à des numéros de forages spécifiés par l'utilisateur en ordre ascendant. Les données des forages choisies sont optionnellement imprimées par MEG0403. Le fichier d'entrée du programme est fourni par MEG0401. Le fichier de sortie de MEG0403 est sembable au fichier maître MEG0401.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

*Programmeur, Laboratoires de recherches minières, Centre canadien de la technologie des minéraux et de l'énergie (CANMET), Energie, Mines et Ressources, Canada, Ottawa.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
      PROGRAM MEG0403(INPUT,OUTPUT,TAPE3,TAPE4,TAPE1=INPUT,TAPE2=OUTPUT)
C*
C*
C*****************************************************************************
C*                                                                             *
C******GENERAL DESCRIPTION                                                     *
C*                                                                             *
C*     PROGRAM MEG0403 CREATES A DISK FILE OF SELECTED MEG DRILLHOLE           *
C*     DATA. THE SORTED FILE MEG0401 IS READ AND SELECTED DRILLHOLE            *
C*     INFORMATION (AS SPECIFIED ON INPUT CARDS) ARE STORED ONTO               *
C*     DISK FILE. THE DRILLHOLE NUMBERS MUST BE SPECIFIED IN ASCENDING         *
C*     ORDER. THE SELECTED DRILLHOLE INFORMATION CAN BE PRINTED ON AN          *
C*     OUTPUT LISTING. THIS PROGRAM HAS BEEN WRITTEN IN CDC FORTRAN            *
C*     LEVEL 4.8 AND WAS ORIGINALLY CREATED BY RUSSELL BOYLE,                  *
C*     (EMR, CANMET, MRL), MAY, 1982.                                          *
C*                                                                             *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                             *
C******OPTIONS READ ON INPUT                                                   *
C*                                                                             *
C*     CARD 1 - ILIST                                                          *
C*              FORMAT(1R1)                                                    *
C*          ILIST  -OPTION TO PRINT THE FILE OF SELECTED MEG DRILL-HOLE        *
C*                  DATA.                                                      *
C*                  ILIST=N DEFAULT DRILL-HOLE DATA ARE NOT PRINTED.           *
C*                  ILIST=Y DRILL-HOLE DATA ARE PRINTED ON OUTPUT.             *
C*                                                                             *
C*     CARD 2 - IHOLE,IHOLE2 (THIS CARD CAN BE REPEATED AS REQUIRED).         *
C*              FORMAT(R7,3X,R7)                                               *
C*          IHOLE  -FIRST MEG DRILLHOLE NUMBER OF A SEQUENCE TO BE             *
C*                  SELECTED FROM FILE MEG0401 AND WRITTEN ONTO DISK           *
C*                  FILE.                                                      *
C*          IHOLE2 -LAST MEG DRILLHOLE NUMBER OF A SEQUENCE TO BE              *
C*                  SELECTED FROM FILE MEG0401 AND WRITTEN ONTO DISK           *
C*                  FILE.                                                      *
C*                 -EXAMPLE OF INPUT DATA CARDS.                               *
C*                  Y                    (DATA CARD 1)                         *
C*                  ZZX0009              (DATA CARD 2)                         *
C*                  ZZX0038   ZZX0039    (DATA CARD 3)                         *
C*                  DATA CARD 1 : OPTION TO PRINT A LISTING OF SELECTED        *
C*                                DRILL-HOLES.                                 *
C*                  DATA CARD 2 : MEG DRILL-HOLE ZZX0009 DATA IS               *
C*                                WRITTEN ONTO A DISK FILE.                    *
C*                  DATA CARD 3 : MEG DRILL-HOLE ZZX0038 TO AND                *
C*                                INCLUDING MEG MEG DRILL-HOLE ZZX0039         *
C*                                ARE WRITTEN ONTO DISK FILE.                  *
C*                 -IHOLE AND IHOLE2 MUST BE SPECIFIED IN ASCENDING            *
C*                  ORDER.                                                     *
C*                                                                             *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                             *
```

```
C******FILES
C*
C*      TAPE1 -INPUT DATA CARDS.
C*      TAPE4 -OUTPUT DISK FILE OF SELECTED DRILLHOLE NUMBERS.
C*      TAPE4 -OUTPUT DSIK FILE OF SELECTED DRILL-HOLES FROM TAPE1.
C*      TAPE2 -OUTPUT LISTING OF 2 SECTIONS.
C*          SECTION 1 OPTIONS APPLIED
C*          SECTION 2 LISTING OF SELECTED DRILL-HOLES AS ON TAPE4.
C*                    THIS SECTION IS ONLY PRINTED IF ILIST IS EQ TO Y
C*                    REFER TO CARD 1 (ILIST).
C*
C*************************************************************************
C*
C*
C*************************************************************************
C*
C******EXECUTION
C*
C*              H0403,CM55000,T100,IO300,P2.
C*              ACCOUNT,*****.
C*              ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=*****,MR=1.
C*              BEGIN,CADD,PROCD,PROGRAMIN=MEG0403,
C*              PFNI= PERMANENT FILE NAME OF INPUT FILE (MEG0401),
C*              PFNO= PERMANENT FILE NAME OF SUBFILE MEG0401.
C*
C*************************************************************************
C*
C*
C*************************************************************************
C*
C******DECLARATIONS
C*
C*
C*************************************************************************
C*
C*
      INTEGER TUDN,C(8),IRECL(8)
C*
C*
C*************************************************************************
C*
C******PROGRAM BODY
C*
C*************************************************************************
C*
      ILIST=1RN
C*     READ AND WRITE SERIES
      READ(3,900) ISER
      READ(1,906) ILIST
      WRITE(4,900) ISER
      WRITE(2,920) ILIST
C*     READ THE DDH TO BE STORED ON P.F. OR TAPE FILE
  200 READ(1,901) IHOLE,IHOLE2
      IF(EOF(1)) 10,20
   20 WRITE(2,902) IHOLE,IHOLE2
C*     SET BLANK DDH TO IHOLE2
      IF(IHOLE2.EQ.555555555555558) IHOLE2=IHOLE
```

CHAPTER 2.0
BLANK OPTION CARD SHEET(S)

MEG0403 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1

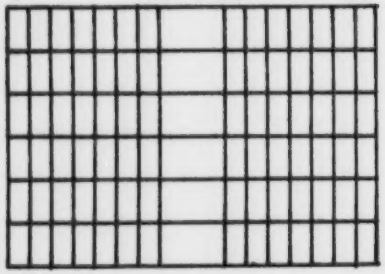
ILIST

1
[ ]

CARD NO. 2 TO E O F

IHOLE IHOLE2

1 ——— 7 8 — 10 11 ——— 17



EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0403,
PFNI=                              , (PERMANENT FILE NAME OF INPUT FILE (MEG0401))
PFNO=                              . (PERMANENT FILE NAME OF OUTPUT FILE (OF SELECTED DRILL-HOLES.)
```

CHAPTER 3.0

EXECUTION OF THE PROGRAM WITH TEST DATA

MEG0403 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R. Boyle

CARD NO. 1

ILIST

1
Y

CARD NO. 2 TO E O F

IHOLE IHOLE2

1 ——— 7 8 — 10 11 ——— 17

Z	Z	X	0	0	3	8		Z	Z	X	0	0	3	9		

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0403,
PFNI= MEG0401ZZXSORTV2          , (PERMANENT FILE NAME OF INPUT FILE (MEG0401))
PFNO= MEG0401ZZXSORTV2PART      . (PERMANENT FILE NAME OF OUTPUT FILE (OF SELECTED DRILL-HOLES.)
```

SECTION -1- OPTIONS APPLIED

CARD	OPTIONS			DESCRIPTION
1	ILIST		Y	OPTION TO PRINT SELECTED DRILL-HOLE DATA Y THE SELECTED DRILL-HOLE DATA ARE PRINTED N DEFAULT DRILL-HOLE DATA ARE NOT PRINTED
2	IHOLE	IHCLE2		LIST OF SELECTED DRILL-HOLES AS SPECIFIED ON INPUT DATA CARDS.

ZZX0038 ZZX0039
** END OF FILE **

SECTION -2- LIST OF DRILL-HOLE DATA

```
ZZX****
ZZX0038   1   770322      112                    12   60.5 20601707710157710l5
ZZX0038   2 C 7600.0 8540.0 1210.5                      AXT
ZZX0038   3  UNDERGROUND HOLE , 200 LEVEL , K ZONE
ZZX0038A001                3    0.0   2.8  0180  K          -1      2.67
ZZX0038B001 ES1    56C          36C          8
ZZX0038A002   32-1         3    2.8   3.8  0180  K          -1      2.67
ZZX0038B002 ES1   280S 0.078  182C          38
ZZX0038A003   32-2         3    6.6   2.1  0180  K          -1      2.67
ZZX0038B003 ES1   813S 0.243  528C         111
ZZX0038A004   32-3         3    8.7   2.8  0180  K          -1      2.67
ZZX0038B004 ES1  1654S 0.393 1105S 0.083  226
ZZX0038A005   32-4         3   11.5   2.3  0180  K          -1      2.67
ZZX0038B005 ES1  2519S 0.462 1637C         343
ZZX0038A006   32-5         3   13.8   2.5  0180  K          -1      2.67
ZZX0038B006 ES1   721S 0.217  469C          98
ZZX0038A007   32-6         3   16.3   3.7  0180  K          -1      2.67
ZZX0038B007 ES1   680S 0.215  442C          93
ZZX0038A008   32-7         3   20.0   1.8  0180  K          -1      2.67
ZZX0038B008 ES1   525S 0.183  341S 0.038   72
ZZX0038A009   32-8         3   21.8   0.5  0180  K          -1      2.67
ZZX0038B009 ES1   507S 0.183  330C          69
ZZX0038A010   32-9         3   22.3   1.2  0180  K          -1      2.67
ZZX0038B010 ES1  2623S 0.468 1705C         358
ZZX0038A011  32-10         3   23.5   1.5  0180  K          -1      2.67
ZZX0038B011 ES1    75S 0.008   49C          10
ZZX0038A012  32-11         3   25.0   1.7  0180  K          -1      2.67
ZZX0038B012 ES1   527S 0.154  343S 0.032   72
ZZX0038A013  32-12         3   26.7   1.3  0180  K          -1      2.67
ZZX0038B013 ES1   538S 0.154  350C          74
ZZX0038A014  32-13         3   28.0   0.9  0180             -1      2.67
ZZX0038B014 ES1   190S 0.049  124C          26
ZZX0038A015  32-14         3   28.9   1.1  0180             -1      2.67
ZZX0038B015 ES1   182S 0.049  118C          25
ZZX0038A016  32-15         3   30.0   1.8  0180             -1      2.67
ZZX0038B016 ES1   320S 0.087  208S 0.018   44
ZZX0038A017  32-16         3   31.8   1.7  0180             -1      2.67
ZZX0038B017 ES1   125S 0.031   81C          17
ZZX0038A018                3   33.5   1.2  0180             -1      2.67
ZZX0038B018 ES1    32C           0C          0
ZZX0038A019                3   34.7   3.6  0180             -1      2.67
ZZX0038B019 ES1     5C           0C          0
ZZX0038A020                3   38.3  22.2  0180             -1      2.67
ZZX0038B020 ES1     0C           0C          0
ZZX0039   1   77033      112 09                 12  183.8 38601707710157710l5
ZZX0039   2 C 7600.0 8551.7 1210.5                      AXT
ZZX0039   3  K + P ZONES , 11.7 FEET MINED-OUT
ZZX0039A001                1    0.0   5.0  0180  K          M-1     2.67
ZZX0039B001           B 0.148                          D0.099
ZZX0039A002                1    5.0   6.7  0180  K          M-1     2.67
ZZX0039B002           B 0.123                          D0.082
ZZX0039A003   33-1         3    0.0   3.3  0360  K          -1      2.67
ZZX0039B003           B0.1213                          D0.081
ZZX0039A004   33-2         3    3.3   1.7  0360  K          -1      2.67
ZZX0039B004           B00.052                          D0.035
ZZX0039A005   33-3         3    5.0   2.2  0360  K          -1      2.67
```

ZZX0039A006	33-4	3	7.2	2.1	0360	R	-1	2.67
ZZX0039B006		B00.297				D0.198		
ZZX0039A007	33-5	3	9.3	1.7	0360		-1	2.67
ZZX0039B007		B00.064				D0.042		
ZZX0039A008		3	11.0	9.0	0360		-1	2.67
ZZX0039B008		0				0		
ZZX0039A009	33-6	3	20.0	1.6	0360		-1	2.67
ZZX0039B009		B 0.021				D0.014		
ZZX0039A010	33-7	3	21.6	2.1	0360		-1	2.67
ZZX0039B010		B 0.098				D0.065		
ZZX0039A011	33-8	3	23.7	1.1	0360		-1	2.67
ZZX0039B011		B 0.028				D0.019		
ZZX0039A012		3	24.8	3.2	0360		-1	2.67
ZZX0039B012		0				0		
ZZX0039A013		3	28.0	0.3	0360		-1	2.67
ZZX0039B013		0				0		
ZZX0039A014		3	28.3	16.3	0360		-1	2.67
ZZX0039B014		0				0		
ZZX0039A015		3	44.6	4.5	0360		-1	2.67
ZZX0039B015		0				0		
ZZX0039A016		3	49.1	0.8	0360		-1	2.67
ZZX0039B016		0				0		
ZZX0039A017		3	49.9	1.3	0360		-1	2.67
ZZX0039B017		0				0		
ZZX0039A018		3	51.2	11.0	0360		-1	2.67
ZZX0039B018		0				0		
ZZX0039A019	33-9	3	62.2	1.9	0360		-1	2.67
ZZX0039B019		B 0.046				D0.030		
ZZX0039A020	33-10	3	64.1	0.8	0360	P	-1	2.67
ZZX0039B020		B 0.438				D0.292		
ZZX0039A021		3	64.9	1.6	0360	P	-1	2.67
ZZX0039B021		0				0		
ZZX0039A022	33-11	3	66.5	0.8	0360	P	-1	2.67
ZZX0039B022		B 0.276				D0.184		
ZZX0039A023		3	67.3	3.5	0360	P	-1	2.67
ZZX0039B023		0				0		
ZZX0039A024	33-12	3	70.8	1.7	0360	P	-1	2.67
ZZX0039B024		B 0.196				D0.131		
ZZX0039A025	33-12	3	72.5	1.6	0360	P	-1	2.67
ZZX0039B025		B 0.196				D0.131		
ZZX0039A026	33-12	3	74.1	0.9	0360	P	-1	2.67
ZZX0039B026		B 0.198				D0.131		
ZZX0039A027		3	75.0	1.7	0360	P	-1	2.67
ZZX0039B027		0				0		
ZZX0039A028	33-13	3	76.7	0.9	0360	P	-1	2.67
ZZX0039B028		B 0.005				D0.003		
ZZX0039A029	33-14	3	77.6	2.4	0360	P	-1	2.67
ZZX0039B029		B 0.634				D0.422		
ZZX0039A030	33-15	3	80.0	2.9	0360	P	-1	2.67
ZZX0039B030		B 0.616				D0.411		
ZZX0039A031	33-16	3	82.9	1.2	0360	P	-1	2.67
ZZX0039B031		B 0.217				D0.145		
ZZX0039A032	33-17	3	84.1	1.4	0360		-1	2.67
ZZX0039B032		B 0.034				D0.022		
ZZX0039A033		3	85.5	47.2	0360		-1	2.67
ZZX0039B033		0				0		
ZZX0039A034	33-18	3	132.7	2.9	0360		-1	2.67
ZZX0039B034		B 0.061				D0.041		
ZZX0039A035		3	135.6	13.9	0360		-1	2.67
ZZX0039B035		0				0		
ZZX0039A036		0	149.5	1.6	0360		0	2.67
ZZX0039B036		0				0		
ZZX0039A037		3	151.1	3.9	0360		-1	2.67
ZZX0039B037		0				0		
ZZX0039A038		3	155.0	17.1	0360		-1	2.67

REFERENCES

1. Boyle, R., "Program MEG0401 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-89(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

---

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

---

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

1. Au meilleur de la connaissance des auteurs, les programmes d'ordinateur des systèmes CADD et GEM opéreront comme ils sont présentés, mais ni les auteurs, ni le CANMET n'offrent de garantie, expressément ou implicitement, quant à l'état complet de la documentation ou à la performance du programme.

2. Les programmes d'ordinateur des systèmes CADD et GEM sont écrits en FORTRAN (CDC, Level 4.8) et COBOL (CDC, Level 4.7). Le CANMET ne garantit pas que ces programmes peuvent être passés sur n'importe quel ordinateur sans effectuer des transformations.

3. Les programmes d'ordinateur de systèmes CADD et GEM sont protégés en vertu du droit d'auteur de la Couronne.

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CANMET

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PROGRAM MEG0405 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle

Mine Evaluation Group

October 1982

This document is an unedited interim report prepared [illegible] for information and [illegible] reporting purposes [illegible] represent a final [illegible] the opinion of the [illegible] for Mineral and Energy Technology (CANMET)

Ce document est un rapport [illegible] préparé et [illegible] pour fin de [illegible] de documentation [illegible] ne représente [illegible] l'évaluation définitive de [illegible] l'opinion du Centre canadien de la technologie des minéraux et de l'énergie (CANMET)

18 pp

ENERGY RESEARCH PROGRAM

MINING RESEARCH LABORATORIES

DIVISION REPORT ERP/MRL 82-92(TR)

PROGRAM MEG0405 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG0405 is to produce an inventory of some basic information found on the title records of a MEG0401 master file. This information consists of: the MEG drillhole number, the company drillhole number, the special identification, the drillhole length, the number of segments, the departure, latitude and elevation of the cellar and the number of continuous drillholes. All this information can be sorted either by MEG drillhole number, company drillhole number or special identification.

The input file of MEG0405 is provided by MEG0401. The output results of MEG0405 can be used to obtain a cross reference of basic information stored on a MEG0401 master file.

The documentation of this program is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG0405
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG0405 est de fournir un inventaire d'information trouvée sur les records titre d'un fichier maître MEG0401. Cette information comprend: le numéro de série MEG, le numéro de sondage de la compagnie, le numéro d'identification spéciale, la longueur du forage, les coordonnées X, Y, Z du collier et le nombre subséquent de sondages qui seront combinés à celui-ci. Toute cette information peut être triée par le numéro de série MEG, par le numéro de sondage de la compagnie ou par le numéro d'identification spéciale.

Le fichier d'entrée de MEG0405 est fourni par MEG0401. Les résultats de MEG0405 peuvent être utilisés afin d'obtenir un tableau de comparaison de l'information enregistrée sur un fichier maître MEG0401.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

---

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
                73/74   OPT=1                                FTN 4.8+528

      1         PROGRAM MEG0405(INPUT,OUTPUT,TAPE3,TAPE4,TAPE7,TAPE5=INPUT,
                -              TAPE6=OUTPUT)
              C*
              C*
      5       C*****************************************************************
              C*                                                               *
              C*******GENERAL DESCRIPTION                                     *
              C*                                                               *
              C*      PROGRAM MEG0405 SORTS TITLE RECORD INFORMATION SUCH AS MEG*
      0       C*      DRILLHOLE NUMBER OR COMPANY DRILLHOLE NUMBER OR SPECIAL  *
              C*      IDENTIFICATION. THE OUTPUT FILE OF MEG0401 IS USED AS THE INPUT *
              C*      FILE OF THIS PROGRAM. THE OUTPUT RESULTS CONSIST OF A LISTING OF*
              C*      MEG DDH NUMBER, COMPANY DDH NUMBER, SPECIAL IDENT, DDH LENGTH,  *
              C*      NUMBER OF SEGMENTS, DEPARTURE, LATITUDE, ELEVATION AND   *
      5       C*      CONTINUOUS NUMBER OF HOLES SORTED ACCORDING TO ONE OF THE THREE *
              C*      FIRST VARIABLES. THE TYPE OF SORT IS SPECIFIED BY THE OPTIONS.  *
              C*      COMPANY DDH NUMBERS ARE LINED UP ACCORDING TO SELECTED   *
              C*      CHARACTERS (ICL) BEFORE THE SORTING IS DONE. THIS PROGRAM HAS   *
              C*      BEEN WRITTEN IN CDC FORTRAN LEVEL 4.8 AND WAS ORIGINALLY CREATED*
      0       C*      BY RUSSELL BOYLE.                                        *
              C*      (EMR, CANMET, MRL), MAY, 1982.                           *
              C*                                                               *
              C*****************************************************************
              C*
      5       C*
              C*****************************************************************
              C*                                                               *
              C*******OPTION READ ON INPUT                                    *
              C*                                                               *
      0       C*      CARD 1 - ISORT,(ICL(I),I=1,5)                            *
              C*               FORMAT(6R1)                                     *
              C*          ISORT   - SPECIFIES THE VARIABLE ON WHICH THE SORT IS TO BE *
              C*                    PERFORMED.                                 *
              C*                    ISORT=C DATA SORTED BY COMPANY NUMBER REFER TO ICL *
      5       C*                    ISORT=M DATA SORTED BY MEG DDH NUMBER      *
              C*                    ISORT=M NO SORT DONE, DATA SORTED BY MEG DDH NUMBER*
              C*                    ISORT=S SORT PERFORMED ON THE SPECIAL IDENT.*
              C*          ICL     - ARRAY OF MAXIMUM 5 CHARACTERS. THESE CHARACTERS ARE*
              C*                    USED TO ALIGN THE COMPANY DDH NUMBER BEFORE THE *
      0       C*                    SORT IS PERFORMED.                         *
              C*                    DO NOT SPECIFY ICL WHEN ISORT=M OR S.      *
              C*                    EXAMPLE ICL(1)=X, ICL(2)=7 THE COMPANY DRILLHOLE *
              C*                    NUMBERS WILL BE SHIFTED TO THE LEFT ACCORDING TO *
              C*                    THE CHARACTER SPECIFIED IN ICL.            *
      5       C*                    (BLANKS ARE IGNORED).                      *
              C*                                                               *
              C*****************************************************************
              C*
              C*
      0       C*****************************************************************
              C*                                                               *
              C*******FILES USED                                              *
              C*                                                               *
              C*      TAPE3 - MEG0401 SORTED MASTER FILE                       *
      5       C*      TAPE4 - SCRATCH DISK FILE USED FOR SORTING.              *
              C*      TAPE7 - SCRATCH DISK FILE OF SORTED DATA                 *
              C*      TAPE5 - INPUT CARD FILE.                                 *
```

```
C*     TAPE6 - OUTPUT LISTING COMPOSED OF 3 SECTIONS.                    *
C*        SECTION 1 OPTION APPLIED.                                      *
C*        SECTION 2 LISTING OF SORTED DATA.                              *
C*        SECTION 3 SUMMARY OF SORT.                                     *
C*                                                                       *
C***********************************************************************
C*
C*
C***********************************************************************
C*                                                                       *
C******REQUIRED SUBROUTINES                                             *
C*                                                                       *
C*     MEG0406 - PRINTS TITLE ON TOP OF EACH PAGE OF OUTPUT LISTING      *
C*     MEG0407 - A CLOCKWISE CHARACTER SHIFT IS PERFORMED TO ALIGN       *
C*               COMPANY DRILLHOLE NUMBERS (LEFT JUSTIFIED) ACCORDING    *
C*               TO ICL.                                                 *
C*                                                                       *
C***********************************************************************
C*
C*
C***********************************************************************
C*                                                                       *
C******EXECUTION                                                        *
C*                                                                       *
C*            H0405,CM55000,T100,IO300,P2.                               *
C*            ACCOUNT.*****.                                             *
C*            ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=*****,MR=1.           *
C*            BEGIN,CADD,PROCD,PROGRAMIN=MEG0405,                        *
C*            PFNI= PERMANENT FILE NAME OF MEG0401 SORTED MASTER FILE.   *
C*                                                                       *
C***********************************************************************
C*
C*
C***********************************************************************
C*                                                                       *
C*                                                                       *
C******VARIABLE NAMES                                                   *
C*       IMDH   !MEG DDH NUMBER                                          *
C*       ICDH   !COMPANY DDH NUMBER                                      *
C*       ISID   !SPECIAL IDENT NUMBER                                    *
C*       ILDH   !DDH LENGTH                                              *
C*       ISEG   !NUMBER OF SEGMENTS IN THE DDH                           *
C*       IDEPT  !COLLAR DEPARTURE                                        *
C*       ILAT   !COLLAR LATITUDE                                         *
C*       IELE   !COLLAR ELEVATION                                        *
C*       ICH    !NUMBER OF CONTINUOUS DDH                                *
C*       ISIRT  !SORT TO BE PERFORMED                                    *
C*              C:SORTED BY COMPANY DDH NUMBER                           *
C*              M:NO SORTED PERFORMED (ALREADY SORTED BY MEG DDH)        *
C*              S:SORTED BY SPECIAL IDENT                                *
C*       ICL    !ARRAY CONTAINING A MAXIMUM OF 5 ALPHA-NUMERIC          *
C*               CHARACTERS USED TO ALIGN COMPANY DDH NUMBERS.           *
C*                                                                       *
C***********************************************************************
C*
C*
C***********************************************************************
```

CHAPTER 2.0

BLANK OPTION CARD SHEET(S)

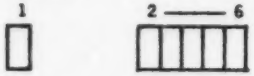
MEG0405 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1

ISORT (ICL(I),I=1,5) FOMRAT(R1,5R1)



5

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0405,
PENI=                          . (PERMANENT FILE NAME OF INPUT FILE (MEG0401))
```

CHAPTER 3.0

EXECUTION OF THE PROGRAM WITH TEST DATA

MEG0405 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R. Boyle

CARD NO. 1

ISORT (ICL(I),I=1,5) FOMRAT(R1,5R1)

1 | 2——6

C | N7

EXECUTION

ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0405,
PENI= MEG0401 22X SORTV2 . (PERMANENT FILE NAME OF INPUT FILE (MEG0401))

SECTION -1- OPTION APPLIED

CARD	OPTIONS		DESCRIPTION
1	ISORT	C	TYPE OF SORT TO BE DONE ISORT=C THE DATA IS SORTED BY COMPANY NUMBER ISORT=M THE DATA IS SORTED BY MEG DRILL-HOLE NUMBER ISORT=S THE DATA IS SORTED BY SPECIAL IDENT
	ICL	X7	COMPANY DRILL-HOLE DATA IS TO BE SORTED AFTER THE CHARACTERS HAVE BEEN ALIGNED ICL(1)= X ICL(2)= 7 ICL(3)= ICL(4)= ICL(5)=

SECTION -2- SORTED DATA

MEG DDH	CO DDH	SP-ID	DDH LENGTH	NSEG	DEPT	LATIT	ELEV	DDH CONTIN
ZZA0038	77032		60.5	20	7600.0	8540.0	1210.5	2
ZZA0039	77033		183.8	38	7600.0	8551.7	1210.5	
ZZA0009	X15		1990.0	20	19720	2590	1152	

SECTION -3- SUMMARY

-----END OF FILE ON ZZX
-----NUMBER OF SORTED DDH 3

REFERENCES

1. Boyle, R., "Program MEG0401 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-89(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

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The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

---

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

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82 - 93 TR

Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

CANMET
Canada Centre for Mineral and Energy Technology
Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG0410 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle
Mine Evaluation Group

October 1982

This document is an unedited interim report prepared primarily for discussion and information reporting purposes. It does not represent a final expression of the opinion of the Canada Centre for Mineral and Energy Technology (CANMET)

Ce document est un rapport provisoire non-révisé et rédigé principalement pour fin de discussion et de documentation. Il ne représente nulle-ment l'expression définitive de l'opinion du Centre canadien de la technologie des minéraux et de l'énergie (CANMET)

17 pp

ENERGY RESEARCH PROGRAM
MINING RESEARCH LABORATORIES
DIVISION REPORT ERP/MRL 82-93(TR)

PROGRAM MEG0410 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG0410 is to find coding errors from MEG0401 master file. Missing records are detected,invalid unit codes and sampling methods are checked, numerical variables are verified. Each record containing an error is identified. The type of error is then declared and printed by the program. The input file of MEG0410 is provided by MEG0401. The results of MEG0410 speeds up the validation and correction of a MEG0401 master file.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG0410
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG0410 est de trouver des erreurs de codification dans un fichier maître MEG0401. Les records manquants sont identifiés, les codes invalides pour les unités de mesures ainsi que pour les méthodes d'échantillonnage sont détectés et les variables numériques sont vérifiées. Chaque record contenant une erreur est identifié. Le type d'erreur est déclaré et imprimé par le programme.

Le fichier d'entré de MEG0410 est fourni par MEG0401. Les résultats de MEG0410 diminuent le temps pour la vérification et la correction d'un fichier maître MEG0401.

*Programmeur, Laboratoires de recherches minières, Centre canadien de la technologie des minéraux et de l'énergie (CANMET), Energie, Mines et Ressources, Canada, Ottawa.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
00001            IDENTIFICATION DIVISION.
00002            PROGRAM-ID. MEG0410.
00003          *
00004          *
00005          *****************************************************************
00006          *                                                               *
00007          * GENERAL DESCRIPTION                                           *
00008          *                                                               *
00009          * PROGRAM MEG0410 IS USED TO DETECT MISSING RECORDS IN THE TITLE,*
00010          * TYPE A AND TYPE B RECORDS. THE DRILLHOLE UNIT CODES ARE       *
00011          * COMPARED WITH THE ONE READ ON INPUT DATA. ASSAYING AND        *
00012          * SAMPLING METHODS ARE COMPARED WITH PERMISSIBLE ONES. NUMERICAL *
00013          * AND ALPHA-NUMERICAL FIELD CONTENTS ARE VERIFIED. ERRORS ARE   *
00014          * PRINTED ON THE OUTPUT LISTING. THE OUTPUT FILE OF MEG0401 IS  *
00015          * USED AS THE INPUT FILE OF THIS PROGRAM. THIS PROGRAM HAS BEEN *
00016          * WRITTEN IN COBOL LEVEL 4.7 AND WAS ORIGINALLY CREATED BY      *
00017          * RUSSELL BOYLE (EMR, CANMET, MRL), MAY, 1982.                  *
00018          *                                                               *
00019          *****************************************************************
00020          *
00021          *
00022          *****************************************************************
00023          *                                                               *
00024          * OPTIONS READ ON INPUT                                         *
00025          *                                                               *
00026          * CARD 1 CIR-SERIE,UNIT-CODES                                   *
00027          *     COL 1-3 CIR-SERIE: MEG SERIES                             *
00028          *     COL 4-7 UNIT CODES: MEG DEPOSIT UNIT CODES AS ON TITLE    *
00029          *                         RECORDS.                              *
00030          *                                                               *
00031          *****************************************************************
00032          *
00033          *
00034          *****************************************************************
00035          *                                                               *
00036          * FILES USED                                                    *
00037          *                                                               *
00038          *     DSKFTN   MEG DRILLHOLES OF SORTED DATA (MEG0401)          *
00039          *     INPUT    INPUT DATA CARDS                                 *
00040          *     OUTPUT   OUTPUT LISTING, SEE DISPOSITION OF OUTPUT        *
00041          *                                                               *
00042          *****************************************************************
00043          *
00044          *
00045          *****************************************************************
00046          *                                                               *
00047          * DISPOSITION OF OUTPUT                                         *
00048          *                                                               *
00049          *         SECTION 1 OPTIONS APPLIED                             *
00050          *         SECTION 2 ERRORS AND SUMMARY                          *
00051          *                                                               *
00052          *****************************************************************
00053          *
00054          *
00055          *****************************************************************
00056          *                                                               *
00057          * EXECUTION                                                     *
```

```
00058          *
00059          *         H0410,CM70000,T100,IO300,P2.                          *
00060          *         ACCOUNT,*****.                                        *
00061          *         ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1         *
00062          *         BEGIN,CADD,PROCD,PROGRAMIN=MEG0410.                   *
00063          *         PFNI=PERMANENT FILE NAME INPUT MEG0401.               *
00064          *                                                               *
00065          *****************************************************************
00066          *
00067          *
00068           ENVIRONMENT DIVISION.
00069           CONFIGURATION SECTION.
00070           SOURCE-COMPUTER. CYBER 730.
00071           OBJECT-COMPUTER. CYBER 730.
00072           INPUT-OUTPUT SECTION.
00073           FILE-CONTROL.
00074               SELECT CARD-IN ASSIGN TO INPUT.
00075               SELECT PRNT-OUT ASSIGN TO OUTPUT.
00076           SELECT MSTR-IN1 ASSIGN TO DSKFTN-FZ.
00077           DATA DIVISION.
00078           FILE SECTION.
00079           FD  CARD-IN
00080                   LABEL RECORDS ARE OMITTED.
00081           01  CI-RECORD.
00082               03  CIR-SERIE                   PIC XXX.
00083               03  CIR-UNIT-CODES              PIC 9999.
00084           FD PRNT-OUT
00085               LABEL RECORDS ARE OMITTED.
00086           01  PO-RECORD.
00087               03  PO-R-1                      PIC X VALUE SPACE.
00088               03  PO-R-2                      PIC X(80).
00089           FD  MSTR-IN1
00090               LABEL RECORDS ARE OMITTED.
00091           01  M1-RECORD-A.
00092               02  M1-KEY-A.
00093                   03 M1-SERIES-A              PIC XXX.
00094                   03 M1-SEQUENCE-A            PIC XXXX.
00095                   03 M1-SHEET-A               PIC X.
00096                   03 M1-LINE-NR-A             PIC XXX.
00097                   03 M1-INTER-CAL-A           PIC X.
00098               02  m1-DATA-A                   PIC X(68).
00099           WORKING-STORAGE SECTION.
00100           01  END-FILE-1                      PIC X          VALUE "N".
00101           01  RECORD-PRINTED                  PIC 9.
00102           01  N-RECORD  COMP-1                PIC 9(6)  VALUE 0.
00103           01  N-ERROR  COMP-1                 PIC 9(6)  VALUE 0.
00104           01  SAMPL-NO                        PIC XXXXX.
00105           01  N-SEGMENTS                      PIC 999.
00106           01  GRAD                            PIC X(6).
00107           01  SUB1    COMP-1                  PIC 9.
00108           01  COUNT-TITLE     COMP-1          PIC 9          VALUE 1.
00109           01  ASSAY-METHOD                    PIC X.
00110           01  JOB-ABORT                       PIC X            VALUE "N".
00111           01  SUM-C-A  COMP-1                 PIC 9999     VALUE 0.
00112           01  SUM-C-B  COMP-1                 PIC 9999     VALUE 0.
00113           01  SUM-TITLE  COMP-1               PIC 9999     VALUE 0.
00114           01  M1-OLD-SEQUENCE                 PIC XXXX.
```

CHAPTER 2.0
BLANK OPTION CARD SHEET(S)

MEG0410 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1

CIR-SERIE (1 — 3) UNIT-CODES (4 — 7)

EXECUTION
```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0410,
PFNI=                              . (PERMANENT FILE NAME OF INPUT FILE (MEG0401))
```

CHAPTER 3.0
EXECUTION OF THE PROGRAM WITH TEST DATA

MEG0410 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R. Boyle

CARD NO. 1

CIR-SERIE (1 — 3)	UNIT-CODES (4 — 7)
ZZX	222

EXECUTION
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0410,
PFNI= MEG0401ZZXSORTV2 . (PERMANENT FILE NAME OF INPUT FILE (MEG0401))

SECTION -1- OPTIONS APPLIED

CARD	OPTIONS		DESCRIPTION
1	CIR-SERIE	ZZX	MEG SERIES
	CIR-UNIT-CODES	222	MEG TITLE UNIT CODES

SECTION -2- ERRORS + SUMMARY

```
ZZX0009   1     X15        112                  63 1990.0 20572555909125912O9
UNIT CODES DO NOT MATCH INPUT UNIT CODES
ZZX0038   1   770322       112                  12   60.5 2060170771015771015
UNIT CODES DO NOT MATCH INPUT UNIT CODES
ZZX0039   1   77033        112 09               12  183.8 3860170771015771015
UNIT CODES DO NOT MATCH INPUT UNIT CODES

                  RECORDS PROCESSED IS      172
                  TOTAL NUMBER OF ERRORS      3

 END OF FILE ENCOUNTERED
```

REFERENCES

1. Boyle, R., "Program MEG0401 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-89(TR), CANMET, Energy, Mines and Resources Canada; 1982.

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L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

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PROGRAM MEGO411 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle

Mine Evaluation Group

October 1982

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17 pp

ENERGY RESEARCH PROGRAM

MINING RESEARCH LABORATORIES

DIVISION REPORT ERP/MRL 82-94(TR)

PROGRAM MEG0411 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG0411 is to find coding errors of numerical variables in a MEG0401 master file. Each numerical variable value is supposed to be within certain limits specified by the user. For example, the collar coordinates are compared with the deposit limits. Distances from collar are compared to the segment length. The grades are compared with their respective maximum values. Each record containing an error is identified. The type of error is then declared and printed by the program.

The input file of MEG0411 is provided by MEG0401. The results of MEG0411 is provided by MEG0401. The results of MEG0411 speeds up the validation and connection of a MEG0401 master file.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

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*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG0410
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG0410 est de trouver des erreurs de codification dans un fichier maître MEG0401. Les records manquants sont identifiés, les codes invalides pour les unités de mesures ainsi que pour les méthodes d'échantillonnage sont détectés et les variables numériques sont vérifiées. Chaque record contenant une erreur est identifié. Le type d'erreur est déclaré et imprimé par le programme.

Le fichier d'entré de MEG0410 est fourni par MEG0401. Les résultats de MEG0410 diminuent le temps pour la vérification et la correction d'un fichier maître MEG0401.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

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*Programmeur, Laboratoires de recherches minières, Centre canadien de la technologie des minéraux et de l'énergie (CANMET), Energie, Mines et Ressources, Canada, Ottawa.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
                73/74   OPT=1                                FTN 4.8+528          0

      PROGRAM MEG0411(INPUT,OUTPUT,DSKFTN,TAPE1=DSKFTN,TAPE5=INPUT,
     -               TAPE6=OUTPUT)
C*
C*
C*****************************************************************************
C*                                                                             *
C*******GENERAL DESCRIPTION                                                    *
C*                                                                             *
C*      PROGRAM MEG0411 IS USED TO DETECT DATA CODING ERRORS                   *
C*      ON FILE MEG0401. THE COLLAR COORDINATES ARE                            *
C*      COMPARED WITH THE LIMITS OF THE DEPOSIT (XL, XH, YL, YH, ZL, ZH)       *
C*      DISTANCES FROM COLLAR ARE VERIFIED, URANIUM, THORIUM AND METAL         *
C*      GRADES ARE COMPARED WITH THEIR RESPECTIVE MAXIMUMS. THE TOTAL          *
C*      DRILL-HOLE LENGTH IS COMPARED WITH THE SUM OF SEGMENTS. ERRORS         *
C*      ARE PRINTED ON THE OUTPUT LISTING. THE PROGRAM WAS WRITTEN IN          *
C*      FORTRAN LEVEL 4.8 AND WAS ORIGINALLY CREATED BY RUSSELL BOYLE,         *
C*      (EMR, CANMET, MRL), MAY, 1982.                                         *
C*                                                                             *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                             *
C*                                                                             *
C*******OPTIONS READ ON INPUT                                                  *
C*      CARD 1 - XL,XH,YL,YH,ZL,ZH                                             *
C*               FORMAT(6F10.0)                                                *
C*          XL     - MINIMUM DEPARTURE OF DEPOSIT                             *
C*          XH     - MAXIMUM DEPARTURE OF DEPOSIT                             *
C*          YL     - MINIMUM LATITUDE OF DEPOSIT                              *
C*          YH     - MAXIMUM LATITUDE OF DEPOSIT                              *
C*          ZL     - MINIMUM ELEVATION OF DEPOSIT                             *
C*          ZH     - MAXIMUM ELEVATION OF DEPOSIT                             *
C*      CARD 2 - (GRO(I),I=1,7)                                                *
C*               FORMAT(7F10.0)                                                *
C*          MET(1) - MAXIMUM GRADE OF U3O8                                     *
C*          MET(2) - MAXIMUM GRADE OF THO2                                     *
C*          MET(3) - MAXIMUM GRADE OF METAL 1                                  *
C*          MET(4) - MAXIMUM GRADE OF METAL 2                                  *
C*          MET(5) - MAXIMUM GRADE OF METAL 3                                  *
C*          MET(6) - MAXIMUM GRADE OF METAL 4                                  *
C*          MET(7) - MAXIMUM GRADE OF METAL 5                                  *
C*                                                                             *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                             *
C*******FILES USED                                                             *
C*                                                                             *
C*      TAPE1 - DSKFTN MEG0401 MASTER SORTED FILE.                             *
C*      TAPE5 - INPUT DATA ON CARDS.                                           *
C*      TAPE6 - OUTPUT LISTING COMPOSED OF 2 SECTIONS.                         *
C*          SECTION 1 OPTIONS APPLIED                                          *
C*          SECTION 2 ERRORS AND SUMMARY                                       *
C*                                                                             *
C*****************************************************************************
```

```
                73/74   OPT=1                                FTN 4.8.528        08

      C*
      C*
0     C*****************************************************************************
      C*                                                                            *
      C******EXECUTION                                                             *
      C*                                                                            *
      C*          H0411,CM55000,T100,IO300,P2.                                      *
5.    C*          ACCOUNT,*****.                                                    *
      C*          ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=****,MR=1.                   *
      C*          BEGIN,CADD,PROCD,PROGRAMIN=MEG0411,                               *
      C*          PFNI= PERMANENT FILE NAME INPUT OF MEG0401.                       *
      C*                                                                            *
0     C*****************************************************************************
      C*
      C*
      C*****************************************************************************
      C*                                                                            *
5     C******DECLARATIONS                                                         *
      C*                                                                            *
      C*****************************************************************************
      C*
      C*
      REAL MET(7),GRO(7)
      INTEGER C(8),IAMO(7),CS(8),IGU(7),IMET(7),A(8)
      DATA IMET/10HU308      ,10HTHO2      ,10HMETAL 1   ,10HMETAL 2   ,
     -          10HMETAL 3   ,10HMETAL 4   ,10HMETAL 5   /
      C*
5     C*
      C*****************************************************************************
      C*                                                                            *
      C******MAIN PROGRAM                                                          *
      C*                                                                            *
0     C*****************************************************************************
      C*
      C*
      IDDH=IER=0
      EPS=0.001
5     READ(5,910) XL,XH,YL,YH,ZL,ZH,(MET(I),I=1,7)
      WRITE(6,970)
      WRITE(6,971) XL,XH,YL,YH,ZL,ZH,(MET(I),I=1,7)
      WRITE(6,972)
      READ(1,900) ISER
0  10 READ(1,901) (C(I),I=1,5),IDTC,IDUM,THL,NSEG,(C(I),I=6,8)
      IF(EOF(1)) 100,15
  15  READ(1,902) (C(I),I=1,2),XC,YC,ZC,(C(I),I=3,7)
      IDDH=IDDH+1
      IE=0
5     SUM=0.0
      SDALOS=0.0
      IF(XC.LT.XL.OR.XC.GT.XH) IE=1
      IF(YC.LT.YL.OR.YC.GT.YH) IE=1
      IF(ZC.LT.ZL.OR.ZC.GT.ZH) IE=1
0     IF(IE) 20,25
  20  WRITE(6,920) (C(I),I=1,2),XC,YC,ZC
      WRITE(6,921)
      IER=IER+1
  25  READ(1,903) (C(I),I=1,8)
```

CHAPTER 2.0

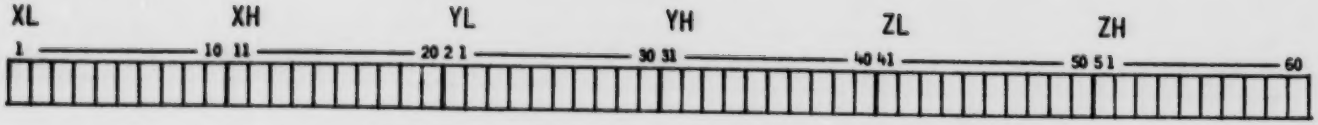
BLANK OPTION CARD SHEET(S)

MEG0411 - OPTION CARDS

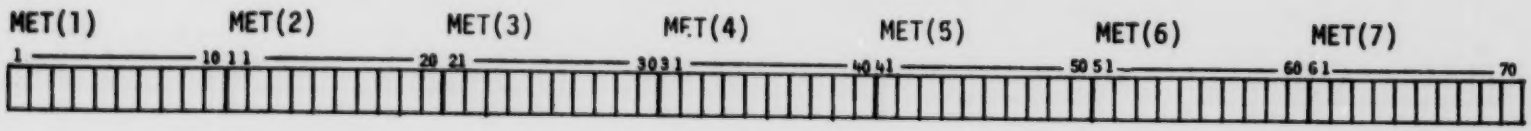
VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1



CARD NO. 2



EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0411,
PFNI=                              . (PERMANENT FILE NAME OF INPUT FILE (MEG0401))
```

CHAPTER 3.0
EXECUTION OF THE PROGRAM WITH TEST DATA

MEG0411 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R. Boyle

CARD NO. 1

XL	XH	YL	YH	ZL	ZH
1 — 10	11 — 20	21 — 30	31 — 40	41 — 50	51 — 60
0.0	9999999.0	0.0	9999999.0	0.0	9999999.0

CARD NO. 2

MET(1)	MET(2)	MET(3)	MET(4)	MET(5)	MET(6)	MET(7)
1 — 10	11 — 20	21 — 30	31 — 40	41 — 50	51 — 60	61 — 70
0.50	0.0	0.20	0.0	0.0	0.0	0.0

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0411,
PFNI=MEG0401227SOACTV2          . (PERMANENT FILE NAME OF INPUT FILE (MEG0401))
```

SECTION -1- OPTIONS APPLIED

CARD	OPTIONS		DESCRIPTION
1	XL	0.0	MINIMUM DEPARTURE OF DEPOSIT
	XH	999999.0	MAXIMUM DEPARTURE OF DEPOSIT
	YL	0.0	MINIMUM LATITUDE OF DEPOSIT
	YH	999999.0	MAXIMUM LATITUDE OF DEPOSIT
	ZL	0.0	MINIMUM ELEVATION OF DEPOSIT
	ZH	999999.0	MAXIMUM ELEVATION OF DEPOSIT
2	MET(1)	.500	MAXIMUM GRADE OF U3O8
	MET(2)	0.000	MAXIMUM GRADE OF THO2
	MET(3)	.200	MAXIMUM GRADE OF METAL 1
	MET(4)	0.000	MAXIMUM GRADE OF METAL 2
	MET(5)	0.000	MAXIMUM GRADE OF METAL 3
	MET(6)	0.000	MAXIMUM GRADE OF METAL 4
	MET(7)	0.000	MAXIMUM GRADE OF METAL 5

SECTION -2- ERRORS + SUMMARY

ZZX003A8004 ES1	ERR. THO2 1654S	.393	1105.0S	.083	226.0	0.000	0.000	0.000	0.000	0.000
ZZX003A8008 FS1	ERR. THO2 525S	.183	341.0S	.038	72.0	0.000	0.000	0.000	0.000	0.000
ZZX003A8012 ES1	ERR. THO2 527S	.154	343.0S	.032	72.0	0.000	0.000	0.000	0.000	0.000
ZZX003A8016 ES1	ERR. THO2 320S	.087	208.0S	.018	44.0	0.000	0.000	0.000	0.000	0.000
ZZX00398005	B	.308	ERR. METAL 1 0.0	0.000	0.0 D	.205	0.000	0.000	0.000	0.000
ZZX00398020	B	.438	ERR. METAL 1 0.0	0.000	0.0 D	.292	0.000	0.000	0.000	0.000
ERR. U308 ZZX00398029	B	.634	ERR. METAL 1 0.0	0.000	0.0 D	.422	0.000	0.000	0.000	0.000
ERR. U308 ZZX00398030	B	.616	ERR. METAL 1 0.0	0.000	0.0 D	.411	0.000	0.000	0.000	0.000

TOTAL NUMBER OF ERRORS 10
TOTAL DDH PROCESSED 3

END OF FILE

REFERENCES

1. Boyle, R., "Program MEG0401 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-89(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

---

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

1. Au meilleur de la connaissance des auteurs, les programmes d'ordinateur des systèmes CADD et GEM opéreront comme ils sont présentés, mais ni les auteurs, ni le CANMET n'offrent de garantie, expressément ou implicitement, quant à l'état complet de la documentation ou à la performance du programme.

2. Les programmes d'ordinateur des systèmes CADD et GEM sont écrits en FORTRAN (CDC, Level 4.8) et COBOL (CDC, Level 4.7). Le CANMET ne garantit pas que ces programmes peuvent être passés sur n'importe quel ordinateur sans effectuer des transformations.

3. Les programmes d'ordinateur de systèmes CADD et GEM sont protégés en vertu du droit d'auteur de la Couronne.

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CANMET

Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG0420 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle

Mine Evaluation Group

October 1982

This document is an unedited **interim report prepared** primarily for discussion and internal reporting purposes. It does not represent a final exercise of the opinion of the Canada Centre for Mineral and Energy Technology **(CANMET)**

Ce document est un rapport [illegible] révisé et rédigé [illegible] fin de [illegible] documentation [illegible] ne représente nulle- [illegible] définitive de [illegible] du Centre canadien de la technologie des minéraux et de l'énergie (CANMET)

21 pp

ENERGY RESEARCH PROGRAM

MINING RESEARCH LABORATORIES

DIVISION REPORT ERP/MRL 82-95(TR)

PROGRAM MEG0420 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG0420 is to replace the rock codes of some drillholes which are specified on input data cards. Program MEG0420 is preferred to MEG0402 when some rock codes of a particular set of drillholes have to be systematically modified.

The input file of MEG0420 is provided by MEG0401. MEG0420 output file is identical to a MEG0401 master file.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

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GUIDE D'USAGER POUR LE PROGRAMME MEG0420
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG0420 est de remplacer les codes pour les types de roche appartenant à certains forages spécifiés par l'utilisateur sur cartes perforées. Le programme MEG0420 est fourni par MEG0401. Le fichier de sortie de MEG0420 est semblable à un fichier maître MEG0401.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

*Programmeur, Laboratoires de recherches minières, Centre canadien de la technologie des minéraux et de l'énergie (CANMET), Energie, Mines et Ressources, Canada, Ottawa.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
                73/74   OPT=1                          FTN 4.8+528          08

1            PROGRAM MEG0420(INPUT,OUTPUT,TAPE1,TAPE2,TAPE5=INPUT,TAPE6=OUTPUT)
      C*
      C*
      C*****************************************************************
5     C*                                                               *
      C******GENERAL DESCRIPTION                                       *
      C*                                                               *
      C*     PROGRAM MEG0420 REPLACES THE ROCK CODES ON SPECIFIED DRILLHOLES.*
      C*     OLD ROCK CODES ON MASTER FILE MEG0401 (TAPE1) ARE CHANGED. THE *
0     C*     ROCK CODE IS COMPOSED OF A ROCK TYPE CODE, A MINERAL CODE AND A *
      C*     CHARACTERISTIC CODE. THE ROCK, MINERAL AND CHARACTERISTIC TYPES *
      C*     HAVE TWO CHARACTERS EACH. THE NEW ROCK CODE WILL REPLACE THEIR  *
      C*     CORRESPONDING OLD ROCK CODES ON FILE MEG0401. THE MAXIMUM NUMBER*
      C*     OF ROCK CODES WHICH CAN BE REPLACED IS 99. THE PROGRAM WAS      *
5     C*     WRITTEN IN CDC FORTRAN LEVEL 4.8 AND WAS ORIGINALLY CREATED BY  *
      C*     RUSSELL BOYLE (EMR, CANMET, MRL) MAY,1982.                     *
      C*                                                                    *
      C*********************************************************************
      C*
0     C*
      C*********************************************************************
      C*                                                                    *
      C******FILES                                                         *
      C*                                                                    *
5     C*     TAPE1  MEG0401 MASTER FILE OF WHICH THE ROCK CODE IS TO BE     *
      C*            CHANGED                                                 *
      C*     TAPE2  NEW MASTER FILE MEG0401 WITH MODIFIED ROCK CODES        *
      C*     TAPE5  INPUT DATA CARDS                                        *
      C*     TAPE6  OUTPUT LISTING                                          *
0     C*            SECTION 1 OPTIONS APPLIED                               *
      C*            SECTION 2 RESULTS                                       *
      C*                                                                    *
      C*********************************************************************
      C*
5     C*
      C*********************************************************************
      C*                                                                    *
      C******OPTIONS READ ON INPUT                                         *
      C*                                                                    *
0     C*     CARD 1 - IR,IM,IC                                              *
      C*              FORMAT(3I3)                                           *
      C*          IR    -NUMBER OF NEW ROCK TYPE CODES                      *
      C*          IM    -NUMBER OF NEW MINERAL CODES                        *
      C*          IC    -NUMBER OF NEW CHARACTERISTIC CODES                 *
5     C*     CARD 2 - (RT(I),I=1,IR)  IR.LE.99                              *
      C*              FORMAT(25R2)                                          *
      C*          RT    -ARRAY OF OLD ROCK TYPE CODES WHICH ARE TO BE       *
      C*                 REPLACED                                           *
      C*              THIS CARD MAY BE REPEATED A MAXIMUM OF 4 TIMES.       *
0     C*     CARD 3 - (MI(I),I=1,IM)   IM.LE.99                             *
      C*              FORMAT(25R2)                                          *
      C*          MI    -ARRAY OF OLD MINERAL CODES WHICH ARE TO BE REPLACED*
      C*              THIS CARD MAY BE REPEATED A MAXIMUM OF 4 TIMES.       *
      C*     CARD 4 - (CI(I),I=1,IC)   IC.LE.99                             *
5     C*              FORMAT(25R2)                                          *
      C*          CI    -ARRAY OF OLD CHARACTERISTIC CODES WHICH ARE TO BE  *
      C*                 REPLACED                                           *
```

```
                73/74   OPT=1                                FTN 4.8+528
C*                    THIS CARD MAY BE REPEATED A MAXIMUM OF 4 TIMES.
C*      CARD 5 - (RX(I),I=1,IR)
C*                    FORMAT(25R2)
C*           RX         -ARRAY OF NEW ROCK TYPE CODES
C*                    THIS CARD MAY BE REPEATED A MAXIMUM OF 4 TIMES.
C*      CARD 6 - (MX(I),I=1,IM)
C*                    FORMAT(25R2)
C*           MX         -ARRAY OF NEW MINERAL CODES
C*                    THIS CARD MAY BE REPEATED A MAXIMUM OF 4 TIMES.
C*      CARD 7 - (CX(I),I=1,IC)
C*                    FORMAT(25R2)
C*           CX         -ARRAY OF NEW CHARACTERISTIC CODES
C*                    THIS CARD MAY BE REPEATED A MAXIMUM OF 4 TIMES.
C*      CARD 8 - IFH,ILH THIS CARD MAY BE REPEATED AS MANY TIMES AS
C*                         REQUIRED.
C*                    FORMAT(R7,3X,R7)
C*           IFH        -FIRST HOLE OF A SEQUENCE OF WHICH THE ROCK CODE IS
C*                       TO BE CHANGED.
C*           ILH        -LAST HOLE OF A SEQUENCE OF WHICH THE ROCK CODE IS
C*                       TO BE CHANGED.
C*                       IFH AND ILH HAVE TO BE SET IN INCREASING ORDER OF
C*                       MEG DRILLHOLE NUMBERS. WHEN ILH IS NOT SPECIFIED IT
C*                       IS SET TO IFH.
C*
C*****************************************************************************
C*
C*
C*****************************************************************************
C*
C*     ******REQUIRED SUBROUTINES
C*
C*      MEG0421 - THIS SUBROUTINE IS USED TO REPLACE OLD ROCK CODES BY
C*                NEW ONES.
C*      MEG0422 - THIS SUBROUTINE IS USED TO SELECT PROPER DRILLHOLES.
C*
C*****************************************************************************
C*
C*
C*****************************************************************************
C*
C*     ******EXECUTION
C*
C*      H0420,CM60000,T200,I0400,P2.
C*      ACCOUNT,*****.
C*      ATTACH,PROCD,MEGFXECCADD,ID=MEGPR,PW=****,MR=1.
C*      BEGIN,CADD,PROCD,PROGRAMIN=MEG0420.
C*      PFNI= PERMANENT FILE NAME INPUT OF MEG0401.
C*      PFNO= PERMANENT FILE NAME OUTPUT MEG0401.
C*
C*****************************************************************************
C*
C*
C*****************************************************************************
C*
C*     ******DECLARATIONS
C*
C*****************************************************************************
```

CHAPTER 2.0
BLANK OPTION CARD SHEET(S)

MEG0420 - OPTION CARDS

VERSION NO. 1
MAY, 1982

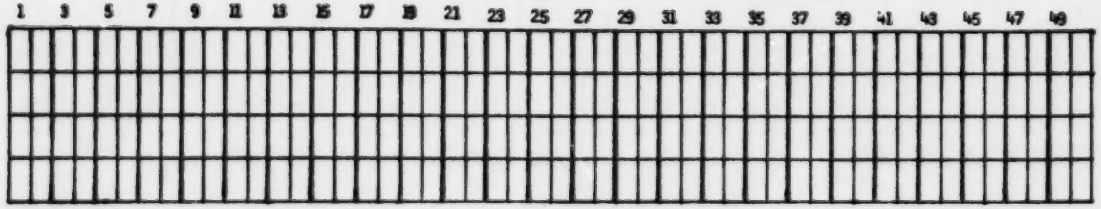
DATE _____
PAGE 1 OF 3
NAME _____

CARD NO. 1

IR (1 - 3) IM (4 - 6) IC (7 - 9)

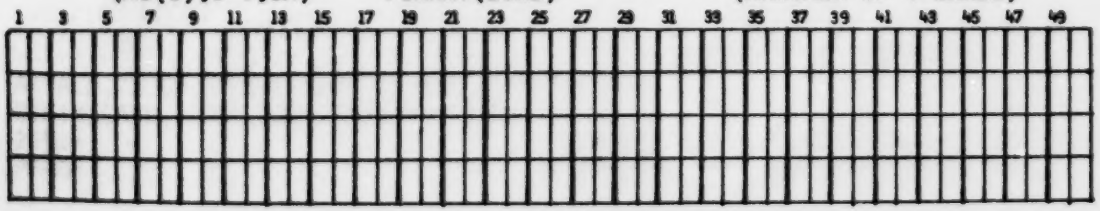
CARD NO. 2

(RT(I),I=1,IR) FORMAT(25R2) (MAXIMUM OF 4 CARDS)



CARD NO. 3

(MI(I),I=1,IM) FORMAT(25R2) (MAXIMUM OF 4 CARDS)



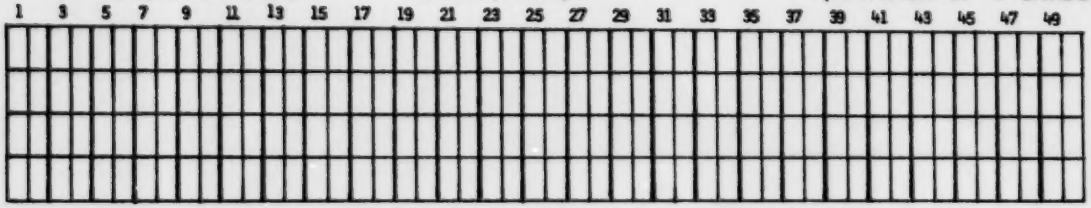
MEG0420 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 2 OF 3
NAME _____

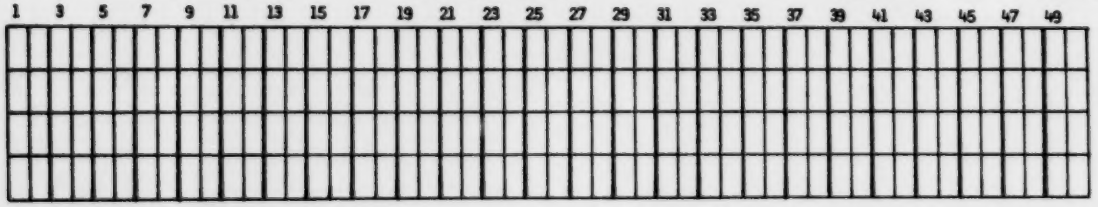
CARD NO. 4

(CI(I),I=1,IC) FORMAT(25R2) (MAXIMUM OF 4 CARDS)



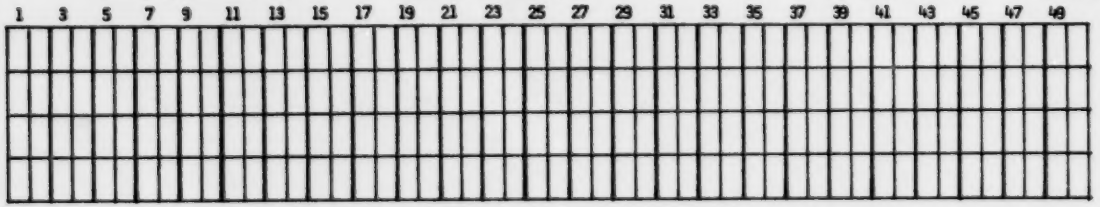
CARD NO. 5

(RX(K),K=1,IR) FORMAT(25R2) (MAXIMUM OF 4 CARDS)



CARD NO. 6

(MX(K),K=1,IM) FORMAT(25R2) (MAXIMUM OF 4 CARDS)



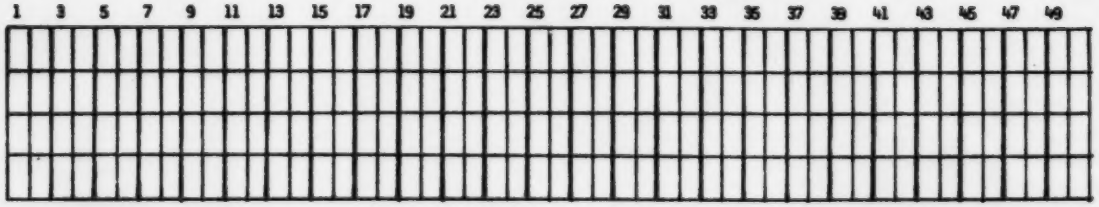
MEG0420 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 3 OF 3
NAME _____

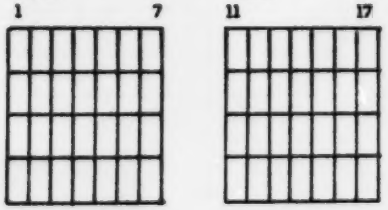
CARD NO. 7

(CX(K),K=1,IC) FORMAT(25R2) MAXIMUM OF 4 CARDS)



CARD NO. 8

IFH ILH



EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1550,
PFNI=                              , (PERMANENT FILE NAME OF INPUT FILE (MEG0401))
PFNO=                              . (PERMANENT FILE NAME OF OUTPUT FILE).
```

CHAPTER 3.0
EXECUTION OF THE PROGRAM WITH TEST DATA

MEG0420 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 3
NAME R. Boyle

CARD NO. 1

IR	IM	IC
1 - 3	4 - 6	7 - 9
3	6	9

CARD NO. 2

(RT(I),I=1,IR) FORMAT(25R2) (MAXIMUM OF 4 CARDS)

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49

A A B B C C

CARD NO. 3

(MI(I),I=1,IM) FORMAT(25R2) (MAXIMUM OF 4 CARDS)

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49

D D E E F F G G H H I I

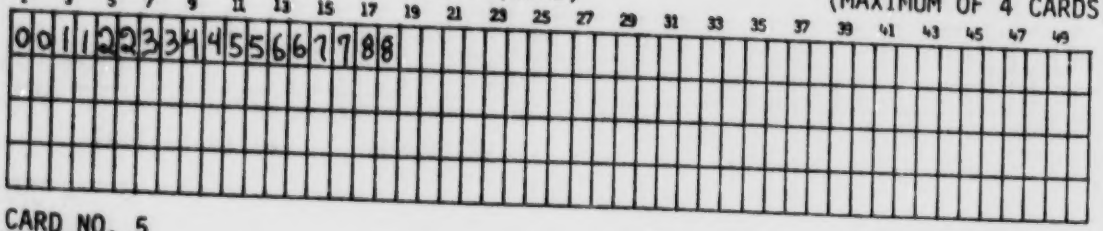
MEG0420 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 2 OF 3
NAME L. Boyle

CARD NO. 4

(CI(I),I=1,IC) FORMAT(25R2) (MAXIMUM OF 4 CARDS)

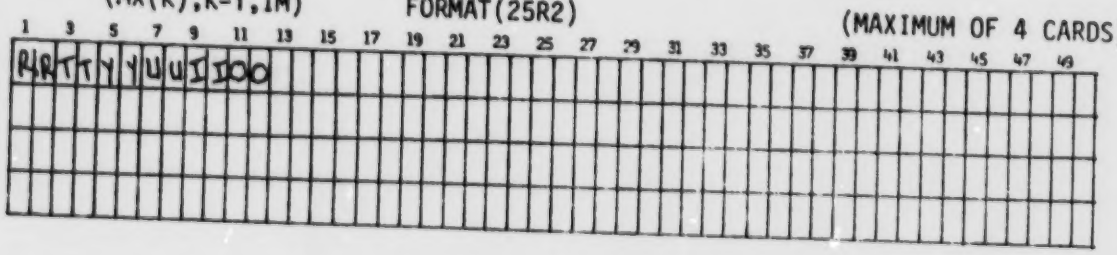


CARD NO. 5

(RX(K),K=1,IR) FORMAT(25R2) (MAXIMUM OF 4 CARDS)

CARD NO. 6

(MX(K),K=1,IM) FORMAT(25R2) (MAXIMUM OF 4 CARDS)



10

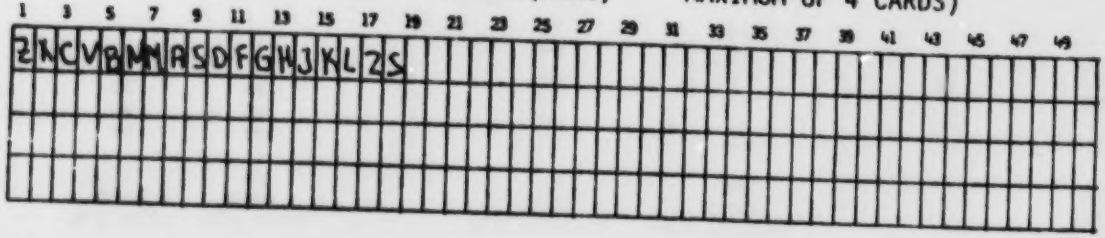
MEG0420 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 3 OF 3
NAME R. Boyle

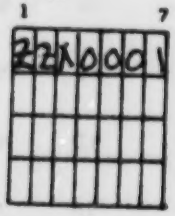
CARD NO. 7

(CX(K),K=1,IC) FORMAT(25R2) MAXIMUM OF 4 CARDS)

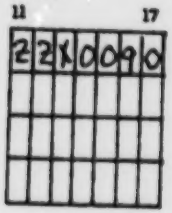


CARD NO. 8

IFH



ILH



EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1550,
PFNI=MEG0401ZZXSORTV2          . (PERMANENT FILE NAME OF INPUT FILE (MEG0401))
PFNO=MEG0401ZZXSORTV3          . (PERMANENT FILE NAME OF OUTPUT FILE).
```

SECTION 1 OPTIONS APPLIED

CARD	OPTIONS	DESCRIPTION
1	IR	
	IM	
	IC	
2	RT	
3	MI	
3	CI	
4	RX	
5	MX	
6	CX	
3		NUMBER OF NEW ROCK CODES TO BE READ
6		NUMBER OF NEW MINERAL CODES TO BE READ
9		NUMBER OF NEW CHARACTERISTIC CODES TO BE READ
		OLD ROCK ABBEVIATIONS WHICH ARE TO BE REPLACED BY THE CORRESPONDING NEW ONES
		OLD MINERAL CODE ABBREVIATIONS WHICH ARE TO BE REPLACED BY THE CORRESPONDING NEW ONES
		OLD CHARACTERISTIC CODES ABBREVIATIONS WHICH ARE TO BE REPLACED BY THE CORRESPONDING OLD ONES
		NEW ROCK CODE ABBREVIATIONS WHICH ARE TO REPLACE THE CORRESPONDING OLD ONES
		NEW MINERAL CODE ABBREVIATIONS WHICH ARE TO REPLACE THE CORRESPONDING OLD ONES
		NEW CHARACTERISTIC CODE ABBREVIATIONS ARE TO REPLACE THE CORRESPONDING OLD ONES

OLD ROCK CODE RT	NEW ROCK CODE RX
AA	QQ
BB	WW
CC	EE

OLD MINERAL CODE MI	NEW MINERAL CODE MX
DD	RR
EE	TT
FF	YY
GG	UU
HH	II
II	OO

OLD CHARACTERISTIC CODE CI	NEW CHARACTERISTIC CODE CX
00	ZX
11	CV
22	BN
33	MA
44	SD
55	FG
66	HJ
77	KL
88	ZS

8

FIRST HOLE	LAST HOLE
0001	0099

ONLY SPECIFIED DRILLHOLES WILL HAVE THEIR ROCK CODES MODIFIED

SECTION 2 RESULTS

NUMBER OF DRILLHOLES PROCESSED IS 3

REFERENCES

1. Boyle, R., "Program MEG0401 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-89(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

---

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

1. Au meilleur de la connaissance des auteurs, les programmes d'ordinateur des systèmes CADD et GEM opéreront comme ils sont présentés, mais ni les auteurs, ni le CANMET n'offrent de garantie, expressément ou implicitement, quant à l'état complet de la documentation ou à la performance du programme.

2. Les programmes d'ordinateur des systèmes CADD et GEM sont écrits en FORTRAN (CDC, Level 4.8) et COBOL (CDC, Level 4.7). Le CANMET ne garantit pas que ces programmes peuvent être passés sur n'importe quel ordinateur sans effectuer des transformations.

3. Les programmes d'ordinateur de systèmes CADD et GEM sont protégés en vertu du droit d'auteur de la Couronne.

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Energy, Mines and Resources Canada | Énergie, Mines et Ressources Canada

CANMET

Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG1000 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle
Mine Evaluation Group

October 1982

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25 pp

ENERGY RESEARCH PROGRAM
MINING RESEARCH LABORATORIES
DIVISION REPORT ERP/MRL 82-96(TR)

PROGRAM MEG1000 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG1000 is to compute additional information from MEG0401 master file and to create a converted master file. The information of MEG0401 master file is converted to imperial units. MEG1000 computes additional information such as: the coordinates of the beginning of each segment. The true, vertical or horizontal projection of a segment; and the computing method of a segment. MEG1000 will optionnally: convert radioactivity values to grades when the equations are provided, estimate missing grades with adjacent values compute the coordinate (normally the deviation) of a specified geological horizon and finally estimate missing densities.

The input file of MEG1000 is provided by MEG0401. MEG1000 output file can be used by the programs of the MEG1000 series as well as some of the GEM programs namely MEG0100, MEG3000 and MEG2040.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG1000
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG1000 est de calculer des variables supplémentaires à partir des données du fichier maître MEG0401 et de créer un nouveau fichier maître MEG0401 transformé. Les variables du fichier maître MEG0401 sont d'abord converties en unités impériales. MEG1000 calcule aussi les variables additionnelles suivantes: les coordonnées du début de chaque segment; la projection vraie, verticale ou horizontale de chaque segment; et la méthode de calcul de la teneur d'un segment. MEG1000 peut optionnellement convertir les mesures radiométriques en teneurs lorsque les équations sont fournies. Il peut estimer les teneurs manquantes à l'aide des teneurs de segments adjacents, calculer un horizon géologique (normalement l'élévation), et finalement estimer les densités manquantes.

Le fichier d'entrée de MEG1000 est fourni par MEG0401. Le fichier de sortie de MEG1000 peut être utilisé par tous les programmes de la série MEG1000 ainsi que par quelques programmes du système GEM, nommément MEG0100, MEG3000 et MEG2040.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

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*Programmeur, Laboratoires de recherches minières, Centre canadien de la technologie des minéraux et de l'énergie (CANMET), Energie, Mines et Ressources, Canada, Ottawa.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
                73/74   OPT=1                                FTN 4.8+528          2

      1         SUBROUTINE MEG1000(INT,IAM,ICM,REA,RGRADE,K6,IRR)
              C*
              C*
              C*****************************************************************
      5       C*                                                               *
              C******GENERAL DESCRIPTION                                        *
              C*                                                               *
              C*     MEG1000 COMPUTES ADDITIONAL INFORMATION FROM THE BASIC DATA *
              C*     STORED ON MEG0401 OUTPUT FILE. MEG1000 WILL ALSO CONVERT DATA TO*
     10       C*     THE IMPERIAL SYSTEM. A LINEAR INTERPOLATION IS MADE BETWEEN THE *
              C*     DIP AND AZIMUTH MEASUREMENTS OF HOLE TO FIND THE DIP AND AZIMUTH*
              C*     OF THE BEGINNING OF EACH SEGMENT. DRILLHOLE SEGMENTS ARE SORTED *
              C*     EITHER BY DEPARTURE, LATITUDE OR ELEVATION. THE COORDINATES     *
              C*     (DEPARTURE, LATITUDE AND ELEVATION) AT THE BEGINNING OF EACH    *
     15       C*     SEGMENTS ARE COMPUTED FROM THE DIP, AZIMUTH AND THE LENGTH OF   *
              C*     EACH SEGMENT. THE TRUE, VERTICAL OR HORIZONTAL PROJECTION OF    *
              C*     EACH SEGMENT IS COMPUTED ACCORDING TO THE DIP AND AZIMUTH OF THE*
              C*     ORE BODY. A COMPUTING METHOD IS ASSIGNED AND TOTAL RADIOACTIVITY*
              C*     CAN OPTIONALLY BE CONVERTED TO LBS/TON U3O8. MISSING GRADES ARE *
     20       C*     ESTIMATED WHENEVER POSSIBLE. COORDINATES IN TERMS OF EITHER     *
              C*     DEPARTURE, LATITUDE OR ELEVATION IS OPTIONALLY FOUND FOR A      *
              C*     GEOLOGICAL HORIZON. THIS PROGRAM HAS BEEN WRITTEN IN CDC FORTRAN*
              C*     LEVEL 4.8 AND WAS ORIGINALLY CREATED BY JIRI FOLTA AND          *
              C*     SUBSEQUENTLY MODIFIED BY RUSSELL BOYLE (EMR, CANMET, MRL),      *
     25       C*     MAY 1982.                                                       *
              C*****************************************************************
              C*
              C*
              C*****************************************************************
     30       C*                                                               *
              C******OPTIONS READ ON INPUT                                      *
              C*                                                               *
              C*     CARD 1 - PSER,PTONFCT,PTYPE,PSORT,PDIP,PAZIM,PCASES,PICLAS,     *
              C*              PEQUA,PEMG,LLCOREC,DALOSM,PSYS,PGH                     *
     35       C*              FORMAT(R3,F7.0,2R1,6I3,I2,F5.0,2I1)                    *
              C*          PSER    - MEG SERIES REPRESENTING A DEPOSIT                *
              C*          PTONFCT - TONNAGE FACTOR, WHEN SET TO 0.0, PICLASS AND CARDS *
              C*                    4-5 SHOULD BE SPECIFIED                        *
              C*          PTYPE   - PROJECTION OF SEGMENT THICKNESS                  *
     40       C*                    IF PTYPE=A APPARENT PROJECTION                 *
              C*                    IF PTYPE=H HORIZONTAL PROJECTION               *
              C*                    IF PTYPE=T TRUE PROJECTION                     *
              C*                    IF PTYPE=V VERTICAL PROJECTION                 *
              C*          PSORT   - SORT OF SEGMENTS BY DISTANCE FROM COLLAR         *
     45       C*                    IF PSORT=D SORT BY DEPARTURE                   *
              C*                    IF PSORT=E SORT BY ELEVATION                   *
              C*                    IF PSORT=L SORT BY LATITUDE                    *
              C*                    PSORT SHOULD BE SET TO E WHEN THE SAMPLE       *
              C*                    CODIFICATION SHEET TYPE DAMH IS USED.          *
     50       C*          PDIP    - DIP OF FORMATION, WHEN SPECIFIED FORMATION DIP ON *
              C*                    TITLE RECORD IS IGNORED                        *
              C*          PAZIM   - AZIMUTH OF DIP OF FORMATION, WHEN SPECIFIED AZIMUTH*
              C*                    ON TITLE RECORD IS IGNORED                     *
              C*          PCASES  - TOTAL # OF RADIOMETRIC EQUATIONS USED TO CONVERT  *
     55       C*                    TOTAL RADIOACTIVITY TO GRADE U3O8              *
              C*          PICLAS  - NUMBER OF CLASSES USED TO ESTIMATE MISSING       *
              C*                    DENSITIES. A MAXIMUM OF 10 CLASSES CAN BE SPECIFIED*
```

```
                73/74   OPT=1                          FTN 4.8+528          21

C*                      DO NOT USE THIS OPTION WHEN PTONFCT AT 0.0
C*            PFQUA   - MAXIMUM # OF EQUATIONS USED FOR ONE RADIOMETRIC
C*                      INSTRUMENT
C*            PEMG    - MISSING GRADES ARE OPTIONALLY ESTIMATED
C*                      IF PEMG=0 DEFAULT MISSING GRADES ARE ESTIMATED
C*                      IF PEMG=1 MISSING GRADES ARE NOT ESTIMATED
C*                      SEGMENTS GRADES ARE ONLY ESTIMATED WHEN
C*                      1- SEGMENTS BELOW AND ABOVE HAVE BEEN ASSAYED
C*                      2- CORE RECOVERY OF BELOW AND ABOVE SEGMENTS ARE
C*                         ABOVE 85%
C*                      3- IF ESTIMATED SEGMENT LENGTH IS LESS THAN OR
C*                         EQUAL TO 1.5 UNITS.
C*            LLCOREC- PERCENTAGE OF CORE RECOVERY USED AS A LIMIT FOR
C*                      BAD-GOOD CORE RECOVERY.
C*                      85% IS THE LIMIT SELECTED BY MFG FOR BAD-GOOD
C*                      CORE RECOVERY. THE USER MAY SELECT A DIFFERENT
C*                      VALUE.
C*            DALOSH  - MAXIMUM APPARENT LENGTH OF ONE SEGMENT. THE
C*                      NEW SEGMENTS DIP AND AZIMUTH ARE COMPUTED WHEN THE
C*                      TITLE RECORDS DAMH ARE SPECIFIED.
C*            PSYS    - SYSTEM IMPERIAL
C*                      IF PSYS=0 DEFAULT DATA CONVERTED TO IMPERIAL SYSTEM
C*            PGH     - NUMBER OF ZONE/ROCK TYPES (MAXIMUM OF 5)
C*                      THIS OPTION IS USED TO STORE ONE OF DEPARTURE.
C*                      LATITUDE OR ELEVATION ON THE TITLE RECORD OF
C*                      FILE MEG1000.
C*            THIS OPTION WILL ONLY APPLY FOR STAND ALONG DRILL-HOLE
C*            (DRILL-HOLES NOT TO BE COMBINED)
C*            REFER TO MEG1600 FOR DRILL-HOLES TO BE COMBINED
C*          CARD 2 - PRERO(I),PBE(I),PXYZ(I),PHOR(I)
C*                   FORMAT(R4,1X,R1,4X,R1,4X,R3)
C*                   THIS CARD IS REPEATED PGH TIMES (MAX OF 5 TIMES).
C*                   DO NOT SPECIFY CARD 2 WHEN PGH IS 0
C*                   THIS OPTION IS USED TO STORE ONE OF DEPARTURE.
C*                   LATITUDE OR ELEVATION COORDINATE ON THE TITLE RECORD
C*                   OF FILE MEG1000. THE COORDINATE IS SELECTED FROM THE
C*                   ROCK TYPE AND/OR ZONE (REEF) CODE. THE END OR BEGINNING
C*                   OF THE SEGMENT COORDINATE CAN ALSO BE SPECIFIED.
C*                   THE INFORMATION PROVIDED BY USING THIS OPTION CAN
C*                   OPTIONALLY BE USED BY PROGRAM MEG3000
C*            PRERO   - ARRAY IDENTIFYING THE GEOLOGICAL FEATURE WHICH
C*                      WILL BE USED AS AN HORIZON
C*                      IF PRERO=ROCK THE SEARCH IS PERFORMED WITH THE
C*                      ROCK TYPE (2 FIRST CHARACTERS OF ROCK CODE).
C*                      IF PRERO=REEF THE SEARCH IS PERFORMED WITH THE
C*                      ZONE (REEF) CODE (3 CHARACTERS)
C*            PBE     - ARRAY INDICATING THE END OR BEGINNING OF SEGMENT
C*                      IF PBE(I)=B BEGINNING COORDINATE OF FIRST SEGMENT
C*                      OF ROCK/ZONE PHOR(I) IS STORED ON FILE TAPE3
C*                      IF PBE(I)=E END COORDINATE OF LAST SEGMENT OF
C*                      ROCK/ZONE PHOR(I).
C*            PXYZ    - ARRAY INDICATING THE COORDINATE TO BE STORED ON
C*                      FILE TAPE3 TITLE RECORD (MEG1000) (MAXIMUM OF 5)
C*                      IF PXYZ(I)=X DEPARTURE COORDINATE IS STORED
C*                      IF PXYZ(I)=Y LATITUDE COORDINATE IS STORED
C*                      IF PXYZ(I)=Z ELEVATION COORDINATE IS STORED
C*            PHOR    - ARRAY INDICATING ZONE/ROCK REPRESENTING A
```

```
                73/74   OPT=1                          FTN 4.8+528
C*                    GEOLOGICAL FEATURE
C*                    ONLY THE 2 FIRST CHARACTERS ARE TO BE USED FOR ROCK
C*                    TYPE. PHOR REPRESENTING A ROCK TYPE SHOULD BE CODED
C*                    ON INPUT IN THE 2 FIRST COLUMNS.
C*                    ALL 3 CHARACTERS ARE TO BE USED FOR ZONE CODE
C*      CARD 3 - RANGE(I),SLOPE(I),A0(I),INSTRU(I)
C*               FORMAT(3F10.3,R3)
C*               DO NOT SPECIFY CARD 3 WHEN PEQUA IS 0. THIS OPTION IS
C*               USED TO ESTIMATE FROM RADIOACTIVITY - GRADE CURVE  THE
C*               THE GRADE OF U3O8. THE RADIOACTIVITY - GRADE CURVE IS
C*               SUBDIVIDED INTO PEQUA LINEAR EQUATIONS (Y=MX+B).
C*               LINEAR EQUATIONS ARE ESTIMATED FOR EACH OF THE
C*               RADIOMETRIC INSTRUMENTS. THIS CARD IS REPEATED PEQUA
C*               TIMES (MAXIMUM OF 20 CARDS). THESE CARDS ARE INPUTED IN
C*               INCREASING ORDER OF RANGE VALUES FOR EACH INSTRUMENT.
C*          RANGE  - ARRAY REPRESENTING THE MAXIMUM RADIOACTIVITY
C*                   GRADE RANGE FOR A GIVEN LINEAR EQUATION
C*          SLOPE  - ARRAY REPRESENTING THE SLOPE OF A GIVEN EQUATION
C*          A0     - ARRAY REPRESENTING THE Y INTERSEPT OF A GIVEN
C*                   EQUATION
C*          INSTRU - ARRAY REPRESENTING THE RADIOMETRIC INSTRUMENT
C*      CARD 4 - (CLASS(K),K=1,PICLAS)
C*               FORMAT(10F5.0)
C*               DO NOT SPECIFY CARD 4 WHEN PICLAS IS 0
C*               THIS CARD IS SPECIFIED WHEN PTONFCT IS SET TO 0.0
C*               CARD 4 AND 5 ARE USED TO ASSIGN A DENSITY VALUE TO
C*               GRADE CLASSES (U3O8).
C*          CLASS  - ARRAY (MAXIMIM OF 10) REPRESENTING THE UPPER
C*                   BOUNDARY GRADES CLASSES.
C*      CARD 5 - (SPG(K),K=1,PICLAS)
C*               FORMAT(10F5.2)
C*               DO NOT SPECIFY CARD 5 WHEN PICLAS IS SET TO 0
C*               THIS CARD IS ONLY TO BE SPECIFIED WHEN PTONFCT IS 0.0
C*               (USED IN CONJUNCTION WITH CARD 4)
C*                   ARRAY (MAXIMIM OF 10) REPRESENTING THE UPPER
C*                   BOUNDARY OF CLASSES. THESE DENSITY LIMITS
C*                   CORRESPOND ONE BY ONE TO THE GRADE LIMITS
C*
C*****************************************************************
C*
C*
C*****************************************************************
C*
C*******DESCRIPTION OF PARAMETERS
C*
C*      LSER   - MEG SERIES REPRESENTING A DEPOSIT
C*      LSTARS - 4 ASTERISKS ****
C*      DT     - DATA OF EXECUTION (MM/DD/YY)
C*      TUDN   - MEG DRILL-HOLE NUMBER
C*      TCDN   - COMPANY DRILL-HOLE NUMBER
C*      TCONTI - NO. OF CONTINUOUS HOLES
C*      TSIOD  - SPECIAL IDENTIFICATION OF DRILL-HOLE
C*      TCODSU - UNIT CODES
C*      TPCKH  - CODES FOR OTHER METALS (TCODSM)
C*      TDAT   - NUMBER OF DAMH RECORDS
C*      TINST  - DAM INSTRUMENT
C*      TLENGT - LENGTH OF DRILL-HOLE
```

```
C*      TNSEG  - NUMBER OF SEGMENTS
C*      TDIPI  - DIP OF HOST FORMATION
C*      TAZIMI - AZIMUTH OF DIP OF HOST FORMATION
C*      TYS    -                    YEAR
C*      TMS    - DATA STARTED      -MONTH
C*      TDS    -                    DAY
C*      TYC    -                    YEAR
C*      TMC    - DATA COMPLETED    -MONTH
C*      TMC    -                    DAY
C*      TIGNOR - USED TO IGNOR A DRILL-HOLE
C*      TDEPT  - DEPARTURE OF COLLAR
C*      TLATIT - LATITUDE OF COLLAR
C*      TELEV  - ELEVATION OF COLLAR
C*      TWATL  - DISTANCE FROM COLLAR TO WATER LEVEL
C*      TWATG  - SPECIFIC GRAVITY OF WATER IN HOLE
C*      TDHSYMB- DDH CODE SYMBOL SIZE
C*      TDHDIAM- DIAMETER OF HOLE (OTHER THAN DDH)
C*      TC1SYMB- INITIAL CASING - DDH CODE SYMBOL (SIZE)
C*      TC1LENT- INITIAL LENGTH OF CASING
C*      TC2SYMB- FINAL CASING - DDH CODE SYMBOL (SIZE)
C*      TC2LENT- FINAL LENGTH OF CASING
C*      TCOMNT - LOCATION OF DRILL-HOLE
C*      TDDFC  - DISTANCE FROM COLLAR TO MEASUREMENTS
C*      TDIPI  - DIP MEASUREMENTS OF HOLE
C*      TAZI   - AZIMUTH MEASUREMENTS OF HOLE
C*      INT    - INT(I,J) I REPRESENTS THE I TH SEGMENT OF THE DDH
C*                        J=1,8
C*                INT(I,1) SAMPLE NUMBER OF SEGMENT -DSAMPL
C*                INT(I,2) SAMPLING METHOD OF SEGMENT - DSM
C*                INT(I,3) DIP OF SEGMENT IN DEGREES - IDTDIPI
C*                INT(I,4) AZIMUTH OF SEGMENT IN DEGREES - IAZIMI
C*                INT(I,5) CORE RECOVERY OF SEGMENT - DECOREC
C*                INT(I,6) ZONE CODE OF SEGMENT (REEF) - REEFCOD
C*                INT(I,7) ROCK CODE OF SEGMENT - ROCTYPE
C*                INT(I,8) MINED OUT CODE OF SEGMENT - MINFOUT
C*      IAM    - IAM(I)   ASSAYING METHOD OF SEGMENT
C*      ICM    - ICM(I)   COMPUTING METHOD OF SEGMENT
C*      REA    - REA(I,J) I REPRESENTS THE I TH SEGMENT OF THE DDH
C*                        J=1,9
C*                REA(I,1) DISTANCE FROM COLLAR OF SEGMENT - DDFC
C*                REA(I,2) ELEVATION OF SEGMENT - SVELEV
C*                REA(I,3) APPARENT LENGTH OF SEGMENT - DALOS
C*                REA(I,4) PROJECTED LENGTH OF SEGMENT OF THE DDH
C*                REA(I,5) DIP OF SEGMENT IN RADIANS - DTDIP
C*                REA(I,6) AZIMUTH OF SEGMENT IN RADIANS - DTAZIM
C*                REA(I,7) DENSITY OF SEGMENT
C*                REA(I,8) DEPARTURE OF SEGMENT - SVDEPT
C*                REA(I,9) LATITUDE OF SEGMENT - SVLATIT
C*      RGRADE - RGRADE(I,7) MATRIX USED TO STORE THE GRADES OF
C*               URANIUM (RGRADE(I,1)), THORIUM (RGRADE(I,2)) AND
C*               5 OTHER METALS ((RGRADE(I,L),L=2,7))
C*      IRR    - ARRAY USED TO STORE THE ROCK TYPE (TEMPORARY STORAGE)
C*
C*****************************************************************
C*
C*
C*****************************************************************
```

```
                73/74   OPT=1                          FTN 4.8+528          21
C*                                                                            *
C******VARIABLE DIMENSIONS                                                    *
C*                                                                            *
C*      K6 - GREATEST NUMBER OF SEGMENTS IN ONE DRILLHOLE TO BE               *
C*           PROCESSED.                                                       *
C*                                                                            *
C*****************************************************************************
C*                                                                            *
C*****************************************************************************
C*                                                                            *
C******FILES USED                                                             *
C*                                                                            *
C*      TAPE1 - INPUT FILE ON DATA CARDS                                      *
C*      TAPE4 - INPUT FILE OF MEG0401 SORTED DATA (INTAPE)                    *
C*              THE FIRST INPUT FORMATED RECORD IS                            *
C*              READ(4,905) LSER,LSTARS                                       *
C*              905 FORMAT(R3,R4)                                             *
C*              THE TITLE INPUT FORMATED RECORD IS                            *
C*              READ(4,920) TUDN,TCDN,TCONTI,TSIOD,TCODSU,                    *
C*                          (TCODSM(I),I=3,7),TDAT,TINST,TLENGT, TNSEG,       *
C*                          TDIPI,TAZIMI,TYS,TMS,TDS,TYC,TMC,TDC,TIGNOR,      *
C*                          TDEPT,TLATIT,TELEV,TWATL,TWATG,TDHSYMB,           *
C*                          TDHDIAM,TC1SYMB,TC1LENT,TC2SYMB,TC2LENT,          *
C*                          TCOMNT                                            *
C*              920 FORMAT(R7,5X,R7,I1,R6,4I1,5I2,4X,I2,R1,F7.0,I3,I2,        *
C*                         I3,6R2,4X,R1,/,13X,3F7.0,9X,F6.0,F4.0,R3,F4.0,     *
C*                         ,R3,F5.0,R3,F5.0,/,12X,6A10,A4)                    *
C*              THE DIP AND AZIMUTH MESUREMENTS OF HOLE (DAMM) FORMATED       *
C*              RECORD IS                                                     *
C*              READ(4,970) TDDFC(J),TDIPI(J),TAZI(J)                         *
C*              970 FORMAT(12X,F8.0,2F10.0)                                   *
C*              THE SHEET TYPE A AND B FORMATED RECORD IS                     *
C*              READ(4,924) DSAMPL,DSM,DDFC,DALOS,DDIPI,DAZIMI,REEFCOD,       *
C*                          ROCTYPE,MINEOUT,DCOREC,IDMETH,DRMGRAV,            *
C*                          DRWGRAV,DPOROS,DRAI,DTOTRA,DAM(1),DGRAD(1),       *
C*                          DRAD(1),DAM(2),DGRAD(2),DRAD(2),                  *
C*                          (DAM(J),DGRAD(J),J=3,7)                           *
C*              924 FORMAT(13X,R10,R1,F7.0,F6.0,6X,R3,R6,3X,R1,I2,4X,         *
C*                         R2,3F4.0,/,12X,R3,F6.0,R1,F6.0,F5.0,R1,F6.0,       *
C*                         F5.0,5(R1,F5.0))                                   *
C*      TAPE3 - OUTPUT FILE OF CONVERTED DATA MEG1000 (OUTAPE)                *
C*              THE FIRST OUTPUT UNFORMATED RECORD IS                         *
C*              WRITE(3) LSER,LSTARS,DT                                       *
C*              THE TITLE OUTPUT UNFORMATED RECORD IS                         *
C*              WRITE(3) TUDN,TCDN,TCONTI,TSIOD,TPCKM,TLENGT,TNSEG,TDIPI      *
C*                       ,TAZIMI,TYS,TMS,TDS,TYC,TMC,TDC,TDEPT,TLATIT,        *
C*                       TELEV,TWATL,TWATG,TDHSYMB,TDHDIAM,TC1SYMB,           *
C*                       TC1LENT,TC2SYMB,TC2LENT,TCOMNT,TCORD,PXYZ            *
C*              THE SEGMENT OUTPUT UNFORMATED RECORD IS                       *
C*              WRITE(3) (INT(I,J),J=1,4),IRC,IRT,IMO,INT(I,8),               *
C*                       (REA(I,J),J=1,9),(IAM(I,J),ICM(I,J),RGRADE(I,J)      *
C*                       ,J=1,7)                                              *
C*      TAPE2 - OUTPUT LISTING                                                *
C*          SECTION -1- INPUT OPTIONS APPLIED                                 *
C*          SECTION -2- ERRORS AND COMMENTS OF PROCESSING                     *
C*          SECTION -3- SUMMARY                                               *
```

```
                73/74   OPT=1                                FTN 4.8+528
C*
C*****************************************************************************
C*
C*
C*****************************************************************************
C*
C*******REQUIRED SUBROUTINES                                                  *
C*                                                                            *
C*      MEG1001 - A COMPUTING METHOD IS ASSIGNED TO EACH GRADE.               *
C*      MEG1002 - THE RADIOMETRIC VALUE IS CONVERTED TO AN ASSAY VALUE.       *
C*                (A PROPER OPTION HAS TO BE SELECTED).                       *
C*      MEG1003 - DRILLHOLE SEGMENTS ARE SORTED IN DECREASING DISTANCES       *
C*                FROM COLLAR.                                                *
C*      MEG1004 - MISSING GRADES ARE ESTIMATED (A PROPER OPTION HAS TO        *
C*                BE SELECTED).                                               *
C*      MEG1005 - FINDS A COORDINATE OF A SPECIFIED GEOLOGICAL HORIZON        *
C*                (A PROPER OPTION HAS TO BE SELECTED).                       *
C*                                                                            *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*
C*******EXECUTION                                                             *
C*                                                                            *
C*      HI000,CM120000,T300,I0500,P2.                                         *
C*      ACCOUNT,*****,                                                        *
C*      ATTACH,PROCD,MEGEXECADD,ID=MEGPR,PW=****,MR=1.                        *
C*      BEGIN,CADD,PROCD,PROGRAMIN=MEG1000.                                   *
C*      PFNI= PERMANENT NAME OF INPUT FILE MEG0401.                           *
C*      PFNO= PERMANENT NAME OF OUTPUT FILE MEG1000.                          *
C*      QA= GREATEST NUMBER OF SEGMENTS IN ONE DDH.                           *
C*                                                                            *
C*****************************************************************************
C*
C*
C*
C*
C*****************************************************************************
C*
C*******DECLARATIONS                                                          *
C*                                                                            *
C*****************************************************************************
C*
C*
      INTEGER PSER,TUDN,TCDN,TSIOD,TCODSU(4),TCODSM(7),TNSEG,TDIPI,
     -        TAZIMI,TYS,TMS,TDS,TYC,TMC,TDC,TIGNOR,TDHSYMB,TINST,
     -        TC1SYMB,TC2SYMB,TCOMNT(7),DDHTBL(30),CASTBL(30),TPCKM,
     -        SVMETAL(7),DSAMPL,DSM,DCOREC,TDAT,DDIPI,DAZIMI,
     -        DRAI,DAM(7),OAM(7),OCM(7),WAM,WCM,ISKP1(8),
     -        WCOEF,INT(K6,8),IAM(K6,7),ICM(K6,7),PUDN,PTYPE,PDIP,
     -            PAZIM,PSORT,MINEOUT,ROCTYPE,REEFCOD
      INTEGER IRR(K6)
      INTEGER PCASES,PICLAS,PEQUA,PEMG,PSYS
      INTEGER PRERO(5),PBE(5),PXYZ(5),PHOR(5),PGH
      REAL DGRAD(7),OGRADE(7),DDHDIAM(30),DDHCORE(30),CASODIA(25),
     -     CASIDIA(25),REA(K6,9),RGRADE(K6,7),DRAD(7)
```

CHAPTER 2.0
BLANK OPTION CARD SHEET(S)

MEG1000 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 2
NAME _____

CARD NO. 1

PSER	PTONFCT	PTYPE	PSORT	PDIP	PAZIM	PCASES	PICLAS	PEQUA	PEMG	LLCOREC	DALOSM	PSYS	PGH
1 — 3	4 — 10	11	12	13 — 15	16 — 18	19 — 21	22 — 24	25 — 27	28 — 30	31 32	33 — 37	38	39

CARD NO. 2

PRERD	PBE	PXYZ	PHOR
1 — 4	6	11	16 — 18

(MAXIMUM OF 5 CARDS)

CARD NO. 3

RANGE	SLOPE	AO	INSTRU
1 — 10	11 — 20	21 — 30	31 — 33

(MAXIMUM OF 20 CARDS)

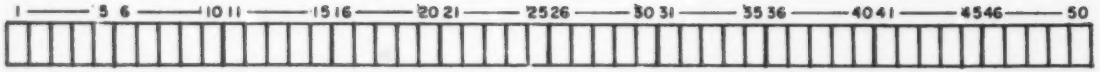
MEG1000 - OPTION CARDS

VERSION NO. 1
MAY 1982

DATE _____
PAGE 2 OF 2
NAME _____

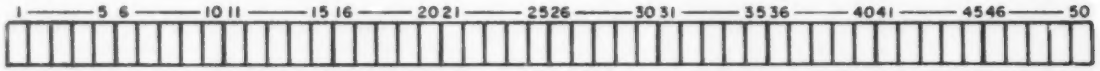
CARD NO. 4

(CLASS(K),K=1,PICLAS)



CARD NO. 5

(SPG(K),K=1,PICLAS)



10

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1000,
PENI=                          ,(PERMANENT FILE NAME OF INPUT FILE (MEG0401))
PFNO=                          ,(PERMANENT FILE NAME OF OUTPUT FILE (MEG1000))
Q6=                            .(DIMENSION VARIABLES).
```

CHAPTER 3.0

EXECUTION OF THE PROGRAM WITH TEST DATA

MEG1000 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 2
NAME R. Boyle

CARD NO. 1

PSER	PTONFCT	PTYPE	PSORT	PDIP	PAZIM	PCASES	PICLAS	PEQUA	PEMG	LLCOREC	DALOSM	PSYS	PGH
1 – 3	4 – 10	11	12	13 – 15	16 – 18	19 – 21	22 – 24	25 – 27	28 – 30	31 32	33 – 37	38	39
ZZK	12.00	A	E							85	50.0		

CARD NO. 2

PRERD	PBE	PXYZ	PHOR
1 – 4	6	11	16 – 18

(MAXIMUM OF 5 CARDS)

CARD NO. 3

RANGE	SLOPE	AO	INSTRU
1 – 10	11 – 20	21 – 30	31 – 33

(MAXIMUM OF 20 CARDS)

12

MEG1000 - OPTION CARDS

VERSION NO. 1
MAY 1982

DATE May, 1982
PAGE 2 OF 2
NAME R. Bayle

CARD NO. 4

(CLASS(K),K=1,PICLAS)

CARD NO. 5

(SPG(K),K=1,PICLAS)

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1000,
PFNI= MEG0401ZX SORTV3      .(PERMANENT FILE NAME OF INPUT FILE (MEG0401))
PFNO= MEG1000ZX             .(PERMANENT FILE NAME OF OUTPUT FILE (MEG1000))
Q6= 200                     .(DIMENSION VARIABLES).
```

```
PROGRAM GEM1000    73/74   OPT=1                    FTN 4.8.528        21/12/82  10.35.12       PAGE     1

1                 PROGRAM GEM1000(INPUT,OUTPUT,INTAPE,OUTAPE,TAPE1=INPUT,
                -                TAPE2=OUTPUT,TAPE3=OUTAPE,TAPE4=INTAPE)
                  INTEGER INT(100,8),IAM(100,7),ICM(100,7),IRR(100)
                  REAL REA(100,9),RGRADE(100,7)
5           C*     KA IS THE NUMBER OF SEGMENTS IN THE DOM
            C*     IN THE PRESENT CASE KA IS 100
            C*     CALL SUBROUTINE MEG1000
                  K6=100
                  CALL MEG1000(INT,IAM,ICM,REA,RGRADE,K6,IRR)
10                STOP
                  END
```

SECTION -1- OPTIONS APPLIED

CARD	OPTION		DESCRIPTION
1	PSER	ZZX	MFG SERIES
	PTONFCT	12.00	TONNAGE FACTOR (IF NOT SPECIFIED PICLASS SHOULD BE SPECIFIED)
	PTYPF	A	PROJECTION OF SEGMENT THICKNESS A APPARENT PROJECTION H HORIZONTAL PROJECTION T TRUE PROJECTION V VERTICAL PROJECTION
	PSORT	E	SORT OF DRILL HOLE D SORT BY DEPARTURE E SORT BY ELEVATION L SORT BY LATITUDE
	PDIP	0	DIP OF FORMATION. WHEN SPECIFIED THE VALUE ON MFG0401 TITLE RECORD IS IGNORED
	PAZIM	0	AZIMUTH OF DIP OF FORMATION. WHEN SPECIFIED THE VALUE ON MFG0401 TITLE RECORD IS IGNOR
	PCASES	0	TOTAL # OF RADIOMETRIC EQUATIONS USED TO CONVERT TOTAL RADIOACTIVITY TO GRADE (1300
	PICLAS	0	NUMBER OF CLASSES USED TO ESTIMATE MISSING DENSITIES (MAX OF 10 CLASSES)
	PEQUA	0	MAXIMUM # OF EQUATIONS USED FOR ONE RADIOMETRIC INSTRUMENT
	PEMG	1	ESTIMATION OF MISSING GRADES 0 DEFAULT MISSING SEGMENTS GRADE IS ESTIMATED 1 MISSING SEGMENTS GRADE IS NOT ESTIMATED
	LLCOREC	85	% OF CORE RECOVERY DELIMITING BAD-GOOD CORE RECOVERY 85% IS THE LIMIT ESTABLISH BY MFG
	DALOSH	50.0	MAXIMUM APPARENT LENGTH OF ONE SEGMENT USED TO ADJUST DIP AND AZIMUTHS OF SEGMENTS ONLY USED WHEN DAHH TITLE CARD IS SPECIFIED
	PSYS	0	DATA CONVERSION 0 DEFAULT DATA CONVERTED TO THE IMPERIAL SYSTEM
	PGH	0	NUMBER (MAX OF 5) OF ZONES/ROCK TYPES FROM WHICH ONE OF DEPARTURE LATITUDE OR ELEVATION IS STORED ON FILE MER1000 THIS OPTION IS USED FOR SELECTING A SPECIFIC GEOLOGICAL STRATA, FORMATION ... (FEATURE)

SECTION -2- ERROR AND COMMENTS

SECTION -3- SUMMARY

DRILL-HOLES READ	3
WRITTEN	3
IGNORED	0

REFERENCES

1. Boyle, R., "Program MEG0401 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-89(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

---

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

1. Au meilleur de la connaissance des auteurs, les programmes d'ordinateur des systèmes CADD et GEM opéreront comme ils sont présentés, mais ni les auteurs, ni le CANMET n'offrent de garantie, expressément ou implicitement, quant à l'état complet de la documentation ou à la performance du programme.

2. Les programmes d'ordinateur des systèmes CADD et GEM sont écrits en FORTRAN (CDC, Level 4.8) et COBOL (CDC, Level 4.7). Le CANMET ne garantit pas que ces programmes peuvent être passés sur n'importe quel ordinateur sans effectuer des transformations.

3. Les programmes d'ordinateur de systèmes CADD et GEM sont protégés en vertu du droit d'auteur de la Couronne.

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Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG1010 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle

Mine Evaluation Group

October 1982

This document is an unedited interim report prepared primarily for ... reporting purposes ... represent ... final ... the opinion of the ... for Mineral and Energy Technology (CANMET)

Ce document est un rapport ... non-révisé et rédigé ... diffusion de documents ... ne représentent ... définitive de l'opinion du Centre canadien de la technologie des minéraux et de l'énergie (CANMET)

18 pp

ENERGY RESEARCH PROGRAM

MINING RESEARCH LABORATORIES

DIVISION REPORT ERP/MRL 82-97(TR)

PROGRAM MEG1010 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG1010 is to create a file of selected drillhole data. A MEG1000 or MEG1600 converted master file is checked out against drillhole numbers specified in ascending order by the user. The selected drillhole information is optionnally printed by MEG1010.

The input file of the program is provided by MEG100 or MEG1600. The file created by MEG1010 is similar to a MEG1000 output file.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG1010
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG1010 est de créer un fichier contenant les données des forages choisis. Les numéros des forages d'un fichier maître transformé fourni par MEG1000 ou MEG1600 sont comparés à des numéros de forages spécifiés par l'utilisateur en ordre ascendant. Les données des forages choisis sont optionnellement imprimées par MEG0403. Le fichier d'entrée du programme est fourni par MEG1000 ou MEG1600. Le fichier de sortie de MEG1010 est semblable au fichier maître transformé MEG1000.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

*Programmeur, Laboratoires de recherches minières, Centre canadien de la technologie des minéraux et de l'énergie (CANMET), Energie, Mines et Ressources, Canada, Ottawa.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
                73/74   OPT=1                          FTN 4.8+528          01

      PROGRAM MEG1010(INPUT,OUTPUT,TAPE3,TAPE4,TAPE5,TAPE2=INPUT,
     -                TAPE1=OUTPUT)
C*
C*
C*****************************************************************************
C*                                                                             *
C*******GENERAL DESCRIPTION                                                    *
C*                                                                             *
C*     MEG1010 IS USED TO CREATE A SUBFILE FROM MASTER FILE MEG1000            *
C*     OR MEG1600 BOOTH FILES ARE UNFORMATED AND CONTAIN THE SAME TYPE         *
C*     OF VARIABLES.                                                           *
C*     A SUBFILE OF MEG DDH IS CREATED FROM FILES MEG1000 OR MEG1600.          *
C*     THE SUBFILE (TAPE4) IS CATALOGUED ON A DISK FILE. THE FILE              *
C*     CONTENT IS UNFORMATED AND HAS THE SAME VARIABLES AS DESCRIBED           *
C*     IN PROGRAM MEG1000. DETAILED CONTENT OF THE FILE (TAPE4) MAY            *
C*     BE PRINTED USING OPTION (IOPT). (THIS OPTION IS NOT RECOMMENDED         *
C*     TO USE DUE TO THE AMOUNT OF INFORMATION TO BE PRINTED).                 *
C*     THE PROGRAM WAS WRITTEN IN CDC FORTRAN LEVEL 4.8 AND WAS                *
C*     ORIGINALLY CREATED BY RUSSELL BOYLE (EMR, CANMET, MRL), MAY 1982        *
C*                                                                             *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                             *
C*******FILES USED                                                             *
C*                                                                             *
C*          INPUT FILES                                                        *
C*               TAPE3 MEG1000 OR MEG1600 MASTER FILE (UNFORMATED)             *
C*               TAPE2 INPUT CARD FILE SEE OPTIONS                             *
C*          OUTPUT FILES                                                       *
C*               TAPE4 MEG1000 OR MEG1600 SUBFILE (UNFORMATED)                 *
C*               TAPE1 OUTPUT LISTING                                          *
C*                     SECTION 1 OPTIONS APPLIED AND RESULTS                   *
C*                     IT IS RECOMMENDED TO ALWAYS SET OPTION IOPT TO NO       *
C*                                                                             *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                             *
C*******OPTIONS READ ON INPUT                                                  *
C*                                                                             *
C*     CARD 1 IOPT                                                             *
C*            FORMAT(R3)                                                       *
C*        IOPT    -OPTION TO PRINT A DETAILED LISTING OF TITLE AND             *
C*                 SEGMENT RECORDS OF SUB-FILE MEG1000.                        *
C*                 YES :MEG DRILLHOLES OF SUB-FILE AND DETAILED                *
C*                 DESCRIPTION OF RECORDS ON SUB-FILE ARE PRINTED ON           *
C*                 OUTPUT LISTING.                                             *
C*                 NO  :ONLY MEG DRILLHOLES ON SUB-FILE ARE PRINTED.           *
C*     CARD 2 IHOLE,IHOLE2                                                     *
C*            FORMAT(R7,3X,R7)                                                 *
C*        IHOLE   -FIRST MEG HOLE OF A SEQUENCE TO BE WRITTEN ON SUB-          *
C*                 FILE TAPE4.                                                 *
C*        IHOLE2  -LAST MEG HOLE OF A SEQUENCE TO BE WRITTEN ON                *
C*                 SUB-FILE TAPE4. BY BLANKING IHOLE2 ONLY MEG HOLE            *
```

```
73/74   OPT=1                                                    FTN 4.8+528
C*                  IHOLE WILL BE WRITTEN ON SUB-FILE TAPE4.
C*                  EXAMPLE   ZZZ0005   ZZZ0010
C*                            MEG HOLE 5 TO 10 INCLUSIVE OF SERIES ZZZ
C*                            WILL BE WRITTEN ON TAPE4.
C*                  EXAMPLE   ZZZ0030
C*                            MEG HOLE 30 OF SERIES ZZZ WILL BE WRITTEN
C*                            ON SUB-FILE TAPE4.
C*                  CARD 2 TO EOF MUST BE SPECIFIED IN INCREASING ORDER
C*                  OF MEG HOLE NUMBER.
C*
C*****************************************************************************
C*
C*
C*****************************************************************************
C*
C******EXECUTION
C*
C*      H1010,CM65000,T200,IO300,P2.
C*      ACCOUNT,*****.
C*      ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=****,MR=1.
C*      BEGIN,CADD,PROCD,PROGRAMIN=MEG1010.
C*      PFNI= PERMANENT FILE NAME OF INPUT FILE MEG1000 OR MEG1600.
C*      PFNO= PERMANENT FILE NAME OF OUTPUT SUBFILE MEG1000 OR MEG1600.
C*
C*****************************************************************************
C*
C*
C*****************************************************************************
C*
C*******DECLARATIONS
C*
C*****************************************************************************
C*
C*
      REAL RGRADE(7)
      INTEGER TIIDN,TCON,TSIOD,                    TNSEG,TDIPI,TAZIMI,
     -TYS,TMS,TDS,TYC,TMC,TDC,          DSAMPL,DSM,DDIPI,DAZIMI,IRC,
     -IMO,DCORFC,ICM(7),IAM(7),TCONTI,
     -TCOMNT(7),TXYZ
C*****************************************************************************
C*
C******PROGRAM BODY
C*
C*****************************************************************************
C*
C*
      READ (3) LSER,LSTAR,IDATE
      WRITE(4) LSER,LSTAR,IDATE
C*       WRITE AND READ THE OPTIONS
      READ(2,115) IOPT
      WRITE(1,900) IOPT
    3 READ(2,110) IHOLE,IHOLE2
      IF(EOF(2)) 4,5
    5 WRITE(1,1000) IHOLE,IHOLE2
      WRITE(5,110) IHOLE,IHOLE2
      GOTO 3
    4 ENDFILE 5
```

CHAPTER 2.0
BLANK OPTION CARD SHEET(S)

MEG1010 - OPTION CARDS

VERSION NO. 1
MAY, 1982

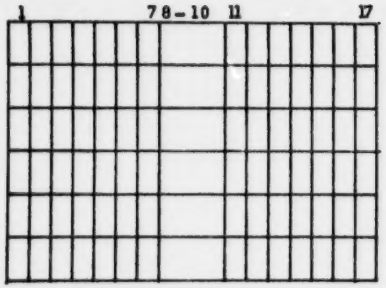
DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1

IOPT

CARD NO. 2 TO EOF

IHOLE IHOLE2



EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0403,
PFNI=                              , (PERMANENT FILE NAME OF INPUT FILE (MEG1000 OR MEG1600))
PFNO=                              . (PERMANENT FILE NAME OF OUTPUT FILE OF SELECTED DRILL HOLES).
```

CHAPTER 3.0

EXECUTION OF THE PROGRAM WITH TEST DATA

MEG1010 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R. Boyle

CARD NO. 1

IOPT

1 3
YES

CARD NO. 2 TO EOF

IHOLE IHOLE2

1 7 8-10 11 17

Z	Z	X	0	0	3	0		Z	Z	X	0	0	5	0		
Z	Z	X	0	0	5	5										
Z	Z	X	0	0	6	0		Z	Z	X	0	0	6	3		
Z	Z	X	0	0	7	0										

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG0403,
PFNI= MEG1600ZZX          , (PERMANENT FILE NAME OF INPUT FILE (MEG1000 OR MEG1600))
PFNO= MEG1600ZZXU2        . (PERMANENT FILE NAME OF OUTPUT FILE OF SELECTED DRILL HOLES).
```

SECTION 1 INPUT OPTIONS AND RESULTS

CARD	OPTIONS		DESCRIPTION
1	IOPT	YES	OPTION TO PRINT A LISTING OF RECORDS FROM SUBFILE MEG1000 OR MEG1600 YES LISTING DESCRIPTION FOR EACH RECORD PRINTED NO RECORDS ARE NOT PRINTED
2 TO EOF			REPRESENTS FIRST AND LAST DRILLHOLE MEG NUMBER OF A SEQUENCE

FIRST HOLE	LAST HOLE
ZZX0030	ZZX0050
ZZX0055	
ZZX0060	ZZX0063
ZZX0070	

```
//////////NEW DRILL HOLE//////////

      TUND=ZZX0038     TCOND=  77032     TCONTI=  2     TSOID              TPMC= 900000000     TLENGT=  244.3
TNSEG= 58     TDIPI=-60     TAZIMI=170     TYS=77     TMS=10     TDS=15
TYC=77     TMC=10     TDC=15     TDEPT=  7600.0     TLATIT=  8540.0     TELEV=  1210.5
TWATL=  0.0          TWATG= 0.0     TDHSYMB=AAT     TDHDIAM= 0.0     TC1SYMB=          TC1LENT=  0.0
TC2SYMB=          TC2LENT=  0.0
TCOMNT= UNDERGROUND HOLE , 200 LEVEL , K ZONE
TCOND=       0.0   TXYZ= :



DSAMPL=              DSM=3     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
DCOREC=  100     DDFC=  172.100     SVELIV=  1210.5     DALOS=   17.100     DTLOS=          17.100 DDIP=  0.000
DAZIM=  9.425     DRDENS=  .0833     SVDEPT=  7600.0     SVLATIT=  8723.8
IAM(I,J),J=1,7)0     0
ICM(I,J),J=1,7)=
RGRADE(I,J),J=1,7)=    0.000          0.000          0.000          0.000          0.000          0.000          0.000

DSAMPL=              DSM=3     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
DCOREC=  100     DDFC=  155.000     SVELIV=  1210.5     DALOS=    3.900     DTLOS=           3.900 DDIP=  0.000
DAZIM=  9.425     DRDENS=  .0833     SVDEPT=  7600.0     SVLATIT=  8706.7
IAM(I,J),J=1,7)0     0
ICM(I,J),J=1,7)=
RGRADE(I,J),J=1,7)=    0.000          0.000          0.000          0.000          0.000          0.000          0.000

DSAMPL=              DSM=0     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
DCOREC=    0     DDFC=  151.100     SVELIV=  1210.5     DALOS=    1.600     DTLOS=           1.600 DDIP=  0.000
DAZIM=  9.425     DRDENS=  .0833     SVDEPT=  7600.0     SVLATIT=  8702.8
IAM(I,J),J=1,7)0     0
ICM(I,J),J=1,7)=
RGRADE(I,J),J=1,7)=    0.000          0.000          0.000          0.000          0.000          0.000          0.000

DSAMPL=              DSM=3     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
DCOREC=  100     DDFC=  149.500     SVELIV=  1210.5     DALOS=   13.900     DTLOS=          13.900 DDIP=  0.000
DAZIM=  9.425     DRDENS=  .0833     SVDEPT=  7600.0     SVLATIT=  8701.2
IAM(I,J),J=1,7)0     0
ICM(I,J),J=1,7)=
RGRADE(I,J),J=1,7)=    0.000          0.000          0.000          0.000          0.000          0.000          0.000

DSAMPL=33-18         DSM=3     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
DCOREC=  100     DDFC=  135.600     SVELIV=  1210.5     DALOS=    2.900     DTLOS=           2.900 DDIP=  0.000
DAZIM=  9.425     DRDENS=  .0833     SVDEPT=  7600.0     SVLATIT=  8687.3
IAM(I,J),J=1,7)8     D
ICM(I,J),J=1,7)=8     A
RGRADE(I,J),J=1,7)=    1.220          0.000          .041          0.000          0.000          0.000          0.000

DSAMPL=              DSM=3     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
DCOREC=  100     DDFC=  132.700     SVELIV=  1210.5     DALOS=   47.200     DTLOS=          47.200 DDIP=  0.000
DAZIM=  9.425     DRDENS=  .0833     SVDEPT=  7600.0     SVLATIT=  8684.4
IAM(I,J),J=1,7)0     0
ICM(I,J),J=1,7)=
RGRADE(I,J),J=1,7)=    0.000          0.000          0.000          0.000          0.000          0.000          0.000

DSAMPL=33-17         DSM=3     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
```

```
DSAMPL=                DSM=3     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
DCOREC=  100     DDFC=  -46.400     SVELIV=   1210.5     DALOS=    3.600     DTLOS=          3.600 DDIP=  0.000
DAZIM=  3.142     DRDENS=  .0833     SVDEPT=   7600.0     SVLATIT=   8505.3
IAM(I,J),J=1,7)C  C
ICM(I,J),J=1,7)=E  E
RGRADE(I,J),J=1,7)=    0.000          0.000          0.000          0.000          0.000          0.000          0.000

DSAMPL=                DSM=3     DDIPI=    0     DAZIM=  180     IRC=          IRT=          IMO=
DCOREC=  100     DDFC=  -50.000     SVELIV=   1210.5     DALOS=   22.200     DTLOS=          22.200 DDIP=  0.000
DAZIM=  3.142     DRDENS=  .0833     SVDEPT=   7600.0     SVLATIT=   8501.7
IAM(I,J),J=1,7)C  C
ICM(I,J),J=1,7)=E  E
RGRADE(I,J),J=1,7)=    0.000          0.000          0.000          0.000          0.000          0.000          0.000

                    END OF FILE
```

REFERENCES

1. Boyle, R., "Program MEG1000 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-96(TR), CANMET, Energy, Mines and Resources Canada; 1982.

2. Boyle, R., "Program MEG1600 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-99(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

---

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

1. Au meilleur de la connaissance des auteurs, les programmes d'ordinateur des systèmes CADD et GEM opéreront comme ils sont présentés, mais ni les auteurs, ni le CANMET n'offrent de garantie, expressément ou implicitement, quant à l'état complet de la documentation ou à la performance du programme.

2. Les programmes d'ordinateur des systèmes CADD et GEM sont écrits en FORTRAN (CDC, Level 4.8) et COBOL (CDC, Level 4.7). Le CANMET ne garantit pas que ces programmes peuvent être passés sur n'importe quel ordinateur sans effectuer des transformations.

3. Les programmes d'ordinateur de systèmes CADD et GEM sont protégés en vertu du droit d'auteur de la Couronne.

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CANMET

Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG1500 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle

Mine Evaluation Group

October 1982

This document is an unedited interim report prepared primarily for circulation and internal reporting purposes. It does not represent a final expression of the opinion of the Canada Centre for Mineral and Energy Technology (CANMET)

Ce document est un rapport provisoire non révisé et rédigé principalement pour fin de diffusion et de documentation interne. Il ne représente nullement une opinion définitive de l'équipe du Centre canadien de la technologie des minéraux et de l'énergie (CANMET)

ENERGY RESEARCH PROGRAM

MINING RESEARCH LABORATORIES

DIVISION REPORT ERP/MRL 82-98(TR)

PROGRAM MEG1500 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG1500 is to print a geological drill log report. The drill log report consists of a section giving a segment by segment detailed rock code description and optionally of section giving assay values. All rock codes are composed of three parts: rock types, mineral types and characteristic types. The rock codes and their corresponding abbreviations are read on input data cards.

The input file of MEG1500 is provided by MEG100 or MEG1600. The report produced by MEG1500 can replace the geologists hand written drill log report.

The documentation of the program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG1500
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG1500 est de créer un rapport géologique avec les données de forage. Le rapport géologique comprend une section donnant la description complète des types de roches pour tous les segments et optionnellement une section donnant les teneurs de ces segments. Tous les codes pour les types de roches sont composés de trois parties: le nom des roches, les principaux minéraux et une caractéristique. Les codes et leur définitions complètes sont sur les cartes perforées.

Le fichier d'entrée de MEG1500 est fourni par MEG100 ou MEG1600. Le rapport produit par MEG1500 peut remplacer un rapport écrit par le géologue.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
                73/74   OPT=1                                FTN 4.8+528          0

      PROGRAM MEG1500(INPUT,OUTPUT,DISKIN,TAPE1=INPUT,TAPE2=OUTPUT,
     -                TAPE3=DISKIN)
C*
C*
C*****************************************************************************
C*                                                                            *
C******GENERAL DESCRIPTION                                                    *
C*                                                                            *
C*     MEG1500 IS USED TO PRINT A COMPLETE DRILL LOG REPORT FROM              *
C*     COMPUTER FILE MEG1000 OR MEG1600.                                      *
C*     THE DRILL LOG REPORT CONSISTS OF A ROCK CODE DESCRIPTION, AND          *
C*     OPTIONALLY AN ASSAY REPORT. THE ROCK CODE IS COMPOSED OF THREE         *
C*     PARTS, ROCK TYPES, MINERAL TYPES AND CHARACTERISTIC TYPES. THE         *
C*     ROCK CODES AND THEIR CORRESPONDING ABBREVIATIONS ARE ON INPUT          *
C*     DATA CARDS. THE PROGRAM WAS WRITTEN IN CDC FORTRAN LEVEL 4.8           *
C*     AND WAS ORIGINALLY CREATED BY JIRI FOLTA AND SUBSEQUENTLY              *
C*     MODIFIED BY RUSSELL BOYLE (EMR, CANMET, MRL), MAY 1982.                *
C*                                                                            *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                            *
C******OPTION READ ON INPUT CARD                                              *
C*                                                                            *
C*     CARD 1 ISYSTEM,IMETAL                                                  *
C*              FORMAT(2I1)                                                   *
C*          ISYSTEM- OPTION TO PRINT METRIC OR IMPERIAL TITLES                *
C*                   0 IMPERIAL TITLES ARE PRINTED                            *
C*                   1 METRIC TITLES ARE PRINTED                              *
C*          IMETAL - OPTION TO PRINT THE METAL REPORT (OTHER THAN U308         *
C*                   AND THO2)                                                *
C*                   0 METAL REPORT IS PRINTED (DEFAULT)                      *
C*                   1 METAL REPORT IS NOT PRINTED                            *
C*     CARD 2-3 (IVALRT(1,J),J=1,74)                                          *
C*                FORMAT(37R2)                                                *
C*          IVALRT - ARRAY OF ROCK TYPE ABBREVIATIONS                         *
C*     CARD 4-16 (IVALEX(1,J),J=1,148)                                        *
C*                FORMAT(6(A10,A2))                                           *
C*          IVALEX - ARRAY OF ROCK TYPE DESCRIPTIONS                          *
C*     CARD 17-18 (IVALRT(2,J),J=1,37)                                        *
C*                FORMAT(37R2)                                                *
C*          IVARLT - ARRAY OF MINERAL TYPE ABBREVIATIONS                      *
C*     CARD 19-31 (IVALREX(2,J),J=1,148)                                      *
C*                FORMAT(6(A10,A2))                                           *
C*          IVALEX - ARRAY OF MINERAL TYPE DESCRIPTION                        *
C*     CARD 32-33 (IVALRT(3,J),J=1,74)                                        *
C*                FORMAT(37R2)                                                *
C*          IVALRT - ARRAY OF CHARACTERISTIC TYPE ABBEVIATIONS                *
C*     CARD 34-46 (IVALEX(3,J),J=1,148)                                       *
C*                FORMAT(6(A10,A2))                                           *
C*          IVALEX - ARRAY OF CHARACTERISTICS DESCRIPTION                     *
C*                                                                            *
C*****************************************************************************
C*
C*
C*****************************************************************************
```

```
                73/74   OPT=1                                FTN 4.8.528          0

      C*
      C******FILES                                                                  *
60    C*                                                                            *
      C*      TAPE1   INPUT DATA CARDS                                              *
      C*      TAPE2   OUTPUT LISTING                                                *
      C*              SECTION 1 OPTIONS APPLIED                                     *
      C*              SECTION 2 DRILL LOG REPORT                                    *
65    C*      TAPE3   (DISKIN) FILE MEG1000 OR MEG1600                              *
      C*                                                                            *
      C*****************************************************************************
      C*
      C*
70    C*****************************************************************************
      C*
      C******REQUIRED SUBROUTINES                                                   *
      C*                                                                            *
      C*      MEG1501 - THIS SUBROUTINE IS USED TO EXTRACT THE NUMERICAL PART       *
75    C*                OF THE DRILLHOLE NUMBER                                     *
      C*      MEG1502 - THIS SUBROUTINE IS USED TO PRINT TITLE ON TOP OF EACH       *
      C*                PAGE.                                                       *
      C*      MEG1503 - THIS SUBROUTINE IS USED TO GET CORRESPONDING ROCK           *
      C*                CODE DESCRIPTIONS FOR ROCK CODE ABBREVIATIONS ON FILE       *
80    C*                MEG1000 OR MEG1600.                                         *
      C*      MEG1504 - THIS SUBROUTINE IS USED TO PRINT THE ASSAY REPORT           *
      C*                TITLE ON EACH PAGE.                                         *
      C*      MEG1505 - THIS SUBROUTINE IS USED TO PRINT THE ASSAY REPORT.          *
      C*                                                                            *
85    C*****************************************************************************
      C*
      C*
      C*****************************************************************************
      C*
90    C******EXECUTION                                                             *
      C*                                                                            *
      C*      H1500,CM75000,T200,IO300,P2.                                          *
      C*      ACCOUNT,*****.                                                        *
      C*      ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=****,MR=1.                       *
95    C*      BEGIN,CADD,PROCD,PROGRAMIN=MEG1500.                                   *
      C*      PFNI= PERMANENT FILE NAME INPUT OF MEG1000 OR MEG1600.                *
      C*                                                                            *
      C*****************************************************************************
      C*
00    C*
      C*****************************************************************************
      C*
      C******DECLARATIONS                                                          *
      C*                                                                            *
05    C*****************************************************************************
      C*
      C*
            INTEGER IVALRT(3,74),IVALEX(3,148),ICOVRT(6),
           -        TUDN,TCDN,TSIOD,TNSEG,
10         -        TYS,TMS,TDS,TYC,TMC,TDC,TDHSYMB,TCONTI,TCOMNT(7),DSAMPL,
           -        DDIP,DAZIM,DRC,DRT,DCOREC,DAM(7),DCM(7),DSM
            REAL DGRADE(7)
            INTEGER DSAMV(65),DAMV(65,5),DCMV(65,5),DCORV(65),METAL(5),TPCKM
            INTEGER TPCKM1
```

CHAPTER 2.0

BLANK OPTION CARD SHEET(S)

MEG1500 - OPTION CARDS

VERSION NO. 1
MAY, 1982

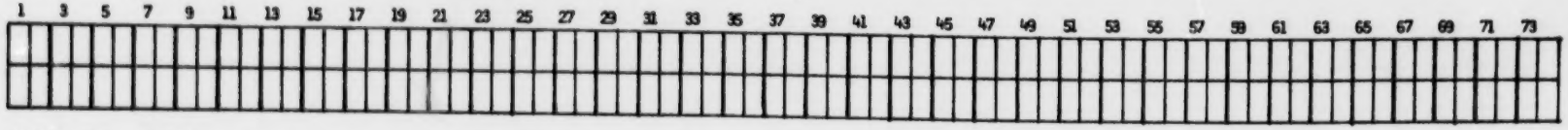
DATE _____
PAGE 1 OF 3
NAME _____

CARD NO. 1

ISYSTEM IMETAL
1 2
[ ] [ ]

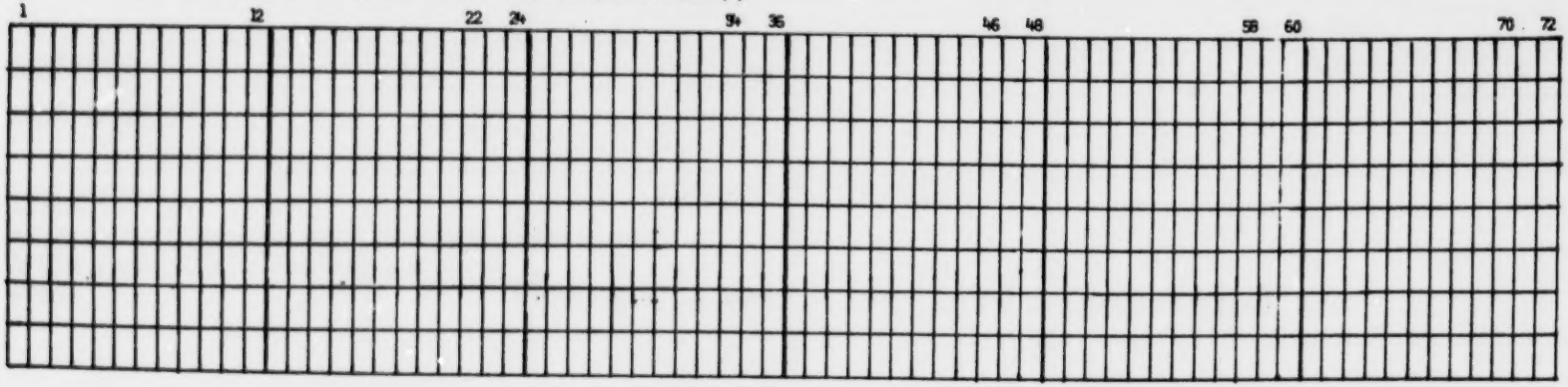
CARD NO. 2-3

(IVALRT(1,J),J=174) FORMAT(37R2)



CARD NO. 4-16

(IVALEX(1,J),J=1,148) FORMAT(6(R10,R2))



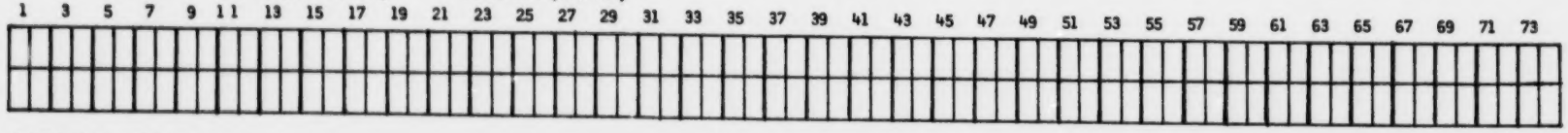
MEG1500 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 2 OF 3
NAME _____

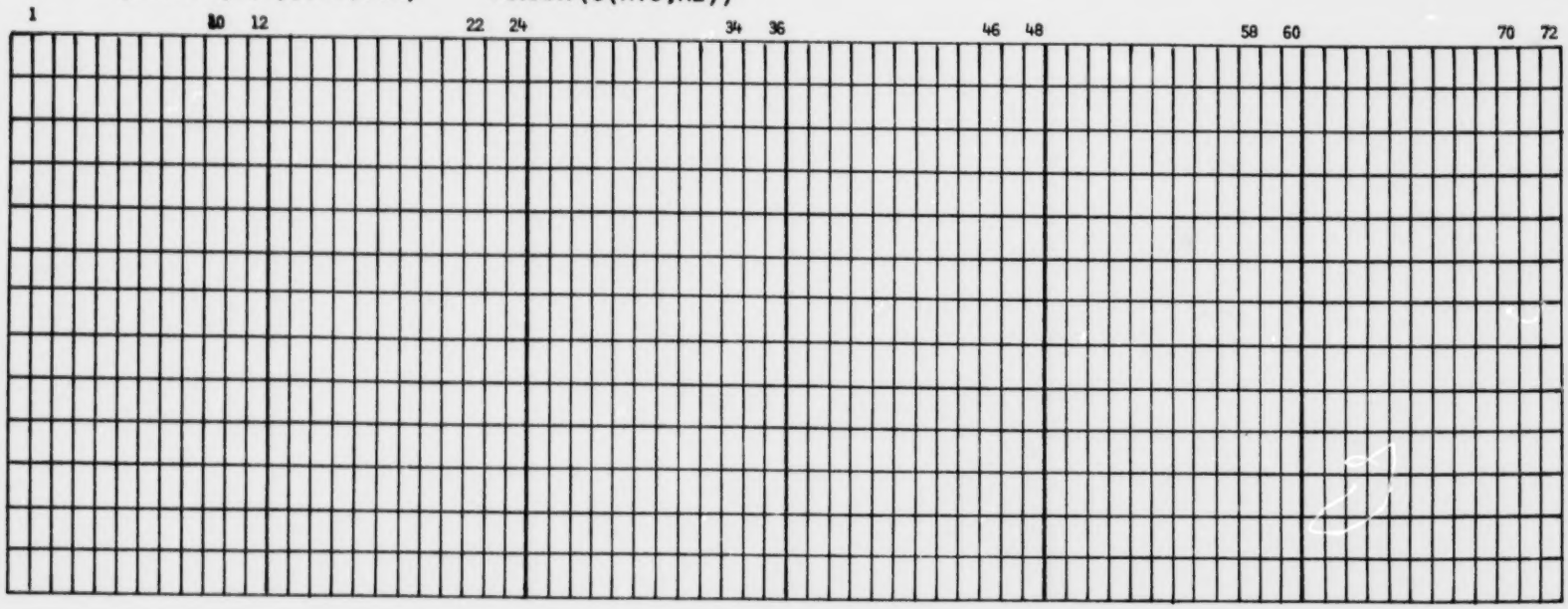
CARD NO. 17-18

(IVALRT(2,J),J=1,74) FORMAT(37R2)



CARD NO. 19-31

(IVALEX(2,J),J=1,148) FORMAT(6(R10,R2))



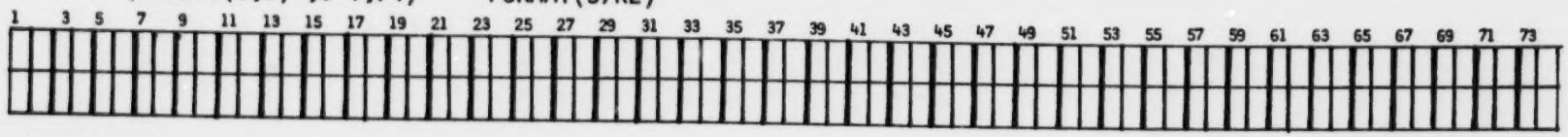
MEG1500 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 3 OF 3
NAME _____

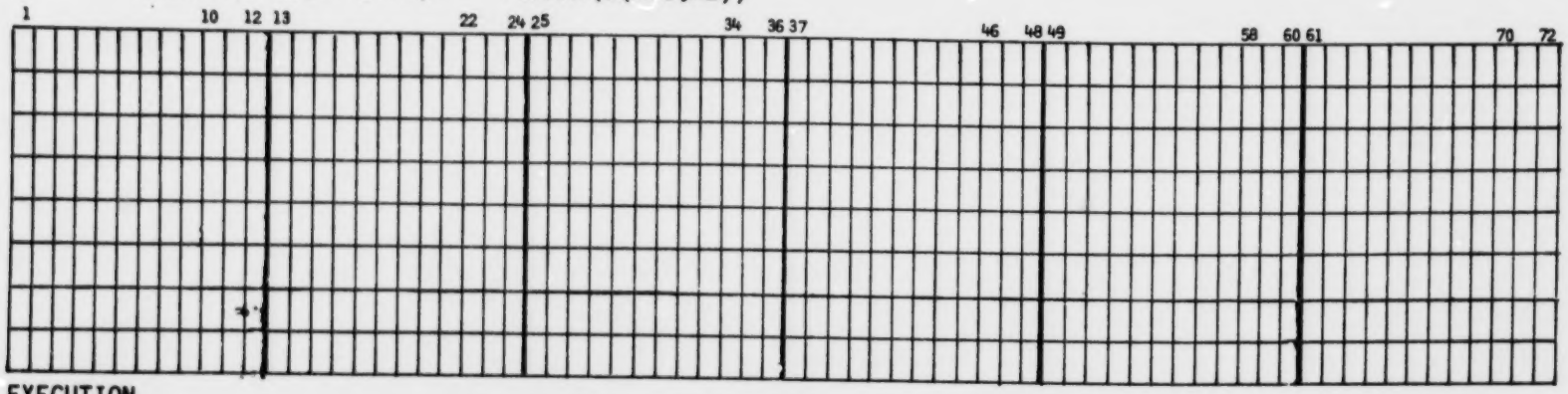
CARD NO. 32-33

(IVALRT(3,J)=,J=1,74) FORMAT(37R2)



CARD NO. 34-46

(IVALEX(3,J),J=1,148) FORMAT(6(R10,R2))



EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1500,
PFNI=                          .PERMANENT FILE NAME OF INPUT FILE (MEG10000R MEG1600)).
```

CHAPTER 3.0

EXECUTION OF THE PROGRAM WITH TEST DATA

MEG1500 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 3
NAME R. Boyle

CARD NO. 1

ISYSTEM IMETAL

1	2
0	0

CARD NO. 2-3

(IVALRT(1,J),J=174) FORMAT(37R2)

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73
A B C D E F G K P Q R S T V W X Y 1 2 3 B C X X

CARD NO. 4-16

(IVALEX(1,J),J=1,148) FORMAT(6(R10,R2))

1 12 22 24 34 36 46 48 58 60 70 72
ARGILITE FLDSP QTZITE CONGLOMERATE DYKE GRNST BSMNT PELITE
GRANITE BMNT ARKOSE PEBBLE QTZTE QUARTZITE GRAYWACKE PALEOSOIC
SILTSTONE VOLCANIC NAISKEY LK CASING CLAY MATINENDA FM
HURONIAN FM UNKNOWN PX BASAL CONGL GROUND CORE

MEG1500 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 2 OF 3
NAME R. Boyle

CARD NO. 17-18

(IVALRT(2,J),J=1,74) FORMAT(37R2)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73
B	C	D	G	H	K	L	M	M	S	U	V																									

CARD NO. 19-31

(IVALEX(2,J),J=1,148) FORMAT(6(R10,R2))

1					10	12				22	24				34	36				46	48				58	60				70	72
PY	BANDS					CHLORITIZED DARK BANDS										GOOD PY MIN				HEMATITIC					CARBONATIC					
CALCITIC						FAIR PY MIN				NO MIN						POOR PY MIN				VISIBLE U					PY STRINGERS					

10

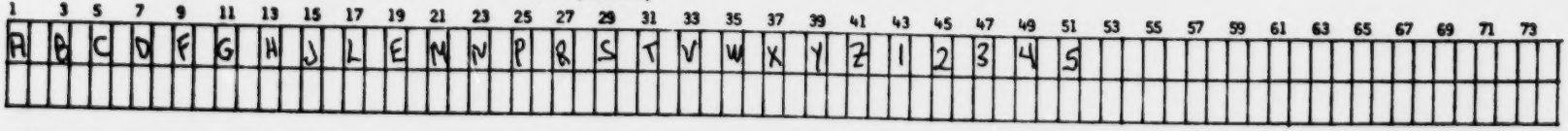
MEG1500 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 3 OF 3
NAME R. Boyle

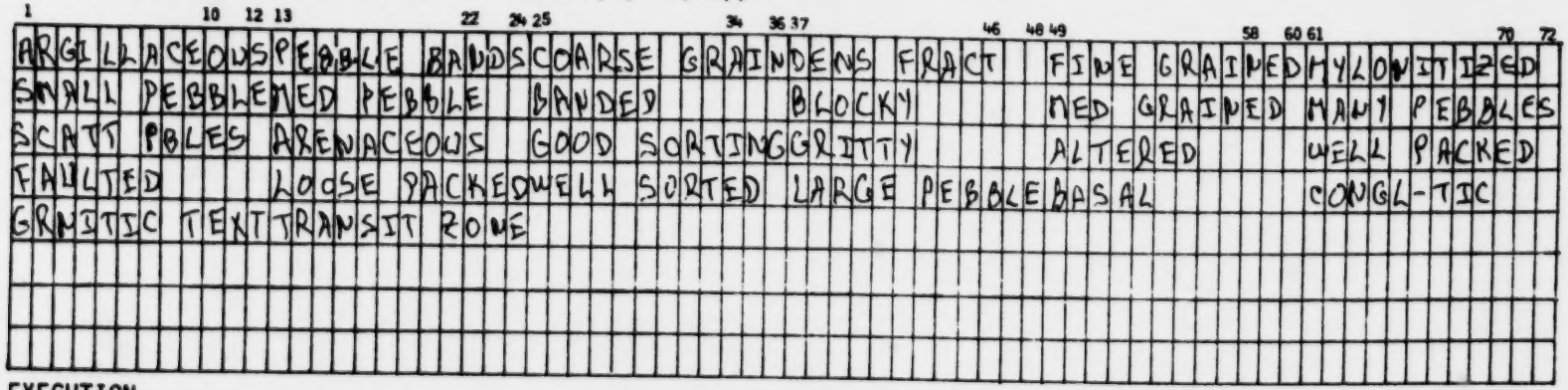
CARD NO. 32-33

(IVALRT(3,J)=,J=1,74) FORMAT(37R2)



CARD NO. 34-46

(IVALEX(3,J),J=1,148) FORMAT(6(R10,R2))



EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1500,
PFNI= MEG1600227                    .PERMANENT FILE NAME OF INPUT FILE (MEG10000R MEG1600)).
```

SECTION 1 OPTIONS APPLIED

CARD	OPTION		DESCRIPTION
1	ISYSTEM	0	DATA CONVERSION 0 DATA IS IN THE IMPERIAL SYSTEM 1 DATA IS IN THE METRIC SYSTEM
	IMETAL	0	METAL REPORT PRINTED 0 REPORT PRINTED 1 REPORT NOT PRINTED

2 TO 64

ROCK TYPE		MINERAL		CHARACTERISTIC	
A	ARGILLITE	B	PY BANDS	A	ARGILLACEOUS
B	FLDSP QTZITE	C	CHLORITIZED	B	PEBBLE BANDS
C	CONGLOMERATE	D	DARK BANDS	C	COARSE GRAIN
D	DYKE	G	GOOD PY MIN	D	DENSE FRACT
E	GRNST BSMNT	H	HEMATITIC	F	FINE GRAINED
F	PELITE	K	CARBONATIC	G	MYLONITIZED
G	GRANITE BMNT	L	CALCITIC	H	SMALL PEBBLE
K	ARKOSE	M	FAIR PY MIN	J	MED PEBBLE
P	PEBBLE QTZTE	N	NO MIN	L	BANDED
Q	QUARTZITE	S	POOR PY MIN	E	BLOCKY
R	GRAYWACKE	U	VISIBLE U	M	MED GRAINED
S	PALEOSOIL	V	PY STRINGERS	N	MANY PEBBLES
T	SILTSTONE			P	SCATT PBLES
V	VOLCANIC			R	ARENACEOUS
W	WHISKEY LK			S	GOOD SORTING
X	CASING			T	GRITTY
Y	CLAY			V	ALTERED
1	MATINENDA FM			W	WELL PACKED
2	HURONIAN FM			X	FAULTED
3	UNKNOWN RX			Y	LOOSE PACKED
BC	BASAL CONGL			Z	WELL SORTED
XX	GROUND CORE			1	LARGE PEBBLE
				2	BASAL
				3	CONGL-TIC
				4	GRNITIC TEXT
				5	TRANSIT ZONE

DIAMOND DRILL LOG / CHIP SAMPLE REPORT

COMPANY DRILL-HOLE NUMBER X15
SPECIAL DRILL-HOLE ID
MEG DRILL-HOLE NUMBER ZZX0009

DDH SYMBOL
LOCATION/COMMENT BWG SURFACE HOLE

DEPARTURE 19720.0
LATITUDE 2590.0
ELEVATION 1152.0
HOLE LENGTH 1935.0

HOLE DIP -55
HOLE AZIMUTH 60
DRILLING STARTED 59/09/12
DRILLING FINISHED 59/12/09

SAMPLE NO.	MISSING SEGM.	FOOTAGE FROM	FOOTAGE TO	WIDTH	PERC. RECOV.	REEF	GEOLOGICAL DESCRIPTION ROCK TYPE	MINERALIZATION	CHARACTERISTICS	U308 LBS/TON	THO LBS/TON
	YES	0.0	-20.0	20.0	0	WW	/	/		NO ASSAY	
		-20.0	-68.0	48.0	90	WW	/	/		NO ASSAY	
		-68.0	-116.0	48.0	90	WW	/	/		NO ASSAY	
		-116.0	-164.0	48.0	90	WW	/	/		NO ASSAY	
		-164.0	-212.0	48.0	90	WW	/	/		NO ASSAY	
		-212.0	-260.0	48.0	90	WW	/	/		NO ASSAY	
		-260.0	-308.0	48.0	90	WW	/	/		NO ASSAY	
		-308.0	-356.0	48.0	90	WW	/	/		NO ASSAY	
		-356.0	-404.0	48.0	90	WW	/	/		NO ASSAY	
		-404.0	-452.0	48.0	90	WW	/	/		NO ASSAY	
		-452.0	-500.0	48.0	90	WW	/	/		NO ASSAY	
		-500.0	-550.0	50.0	90	WW	/	/		NO ASSAY	
		-550.0	-600.0	50.0	90	WW	/	/		NO ASSAY	
		-600.0	-650.0	50.0	90	WW	/	/		NO ASSAY	
		-650.0	-700.0	50.0	90	WW	/	/		NO ASSAY	
		-700.0	-750.0	50.0	90	WW	/	/		NO ASSAY	
		-750.0	-800.0	50.0	90	WW	/	/		NO ASSAY	
		-800.0	-850.0	50.0	90	WW	/	/		NO ASSAY	
		-850.0	-900.0	50.0	90	WW	/	/		NO ASSAY	
		-900.0	-950.0	50.0	90	WW	/	/		NO ASSAY	
		-950.0	-1000.0	50.0	90	WW	/	/		NO ASSAY	
		-1000.0	-1050.0	50.0	90	WW	/	/		NO ASSAY	
		-1050.0	-1100.0	50.0	90	WW	/	/		NO ASSAY	
		-1100.0	-1150.0	50.0	90	WW	/	/		NO ASSAY	
		-1150.0	-1200.0	50.0	90	WW	/	/		NO ASSAY	
		-1200.0	-1250.0	50.0	90	WW	/	/		NO ASSAY	
		-1250.0	-1300.0	50.0	90	WW	/	/		NO ASSAY	
		-1300.0	-1350.0	50.0	90	WW	/	/		NO ASSAY	
		-1350.0	-1400.0	50.0	90	WW	/	/		NO ASSAY	
		-1400.0	-1450.0	50.0	90	WW	/	/		NO ASSAY	
		-1450.0	-1500.0	50.0	90	WW	/	/		NO ASSAY	
		-1500.0	-1542.5	42.5	90	WW	/	/		NO ASSAY	
		-1542.5	-1585.0	42.5	90	WW	/	/		NO ASSAY	
		-1585.0	-1627.5	42.5	90	WW	/	/		NO ASSAY	
		-1627.5	-1631.7	4.2	100	W	/	/		NO ASSAY	
		-1631.7	-1672.4	40.7	100	W	/	/		NO ASSAY	
		-1672.4	-1713.1	40.7	100	W	/	/		NO ASSAY	
		-1713.1	-1720.0	6.9	100	W	/	/		NO ASSAY	
1595		-1720.0	-1725.0	5.0	100	M	/	/		NO ASSAY	
1596		-1725.0	-1726.4	1.4	100	M	/	/		3.24	
1597		-1726.4	-1731.4	5.0	100	M	/	/		.64	
1598		-1731.4	-1735.0	3.6	100	M	/	/		3.56	
1599		-1735.0	-1740.0	5.0	100	M	/	/		4.54	
		-1740.0	-1750.8	10.8	100	W	/	/		2.92	
		-1750.8	-1796.8	46.0	100	W	/	/		NO ASSAY	
		-1796.8	-1842.8	46.0	100	W	/	/		NO ASSAY	
		-1842.8	-1888.8	46.0	100	W	/	/		NO ASSAY	
		-1888.8	-1935.0	46.2	100	W	/	/		NO ASSAY	

DIAMOND DRILL LOG / CHIP SAMPLE REPORT

COMPANY DRILL-HOLE NUMBER	77032				
SPECIAL DRILL-HOLE ID		DEPARTURE	7600.0	HOLE DIP	0
MEG DRILL-HOLE NUMBER	ZZX0038	LATITUDE	8540.0	HOLE AZIMUTH	180
COMBINE WITH DRILL-HOLE	ZZX0039	ELEVATION	1210.5	DRILLING STARTED	77/10/15
DDH SYMBOL	AXT	HOLE LENGTH	244.3	DRILLING FINISHED	77/10/15
LOCATION/COMMENT	UNDERGROUND HOLE • 200 LEVEL • K ZONE				

SAMPLE NO.	MISSING SEGM.	FOOTAGE FROM	FOOTAGE TO	WIDTH	PERC. RECOV.	REEF	GEOLOGICAL DESCRIPTION ROCK TYPE	MINERALIZATION	CHARACTERISTICS	U3O8 LBS/TON	THO2 LBS/TON
		172.1	155.0	17.1	100		/	/		NO ASSAY	
		155.0	151.1	3.9	100		/	/		NO ASSAY	
	YES	151.1	149.5	1.6	0		/	/		NO ASSAY	
		149.5	135.6	13.9	100		/	/		NO ASSAY	
33-18		135.6	132.7	2.9	100		/	/		1.22	
		132.7	85.5	47.2	100		/	/		NO ASSAY	
33-17		85.5	84.1	1.4	100		/	/		.68	
33-16		84.1	82.9	1.2	100	P	/	/		4.34	
33-15		82.9	80.0	2.9	100	P	/	/		12.32	
33-14		80.0	77.6	2.4	100	P	/	/		12.68	
33-13		77.6	76.7	.9	100	P	/	/		.10	
		76.7	75.0	1.7	100	P	/	/		NO ASSAY	
33-12		75.0	74.1	.9	100	P	/	/		3.96	
33-12		74.1	72.5	1.6	100	P	/	/		3.92	
33-12		72.5	70.8	1.7	100	P	/	/		3.92	
		70.8	67.3	3.5	100	P	/	/		NO ASSAY	
33-11		67.3	66.5	.8	100	P	/	/		5.52	
		66.5	64.9	1.6	100	P	/	/		NO ASSAY	
33-10		64.9	64.1	.8	100	P	/	/		8.76	
33-9		64.1	62.2	1.9	100		/	/		.92	
		62.2	51.2	11.0	100		/	/		NO ASSAY	
		51.2	49.9	1.3	100		/	/		NO ASSAY	
		49.9	49.1	.8	100		/	/		NO ASSAY	
		49.1	44.6	4.5	100		/	/		NO ASSAY	
		44.6	28.3	16.3	100		/	/		NO ASSAY	
		28.3	28.0	.3	100		/	/		NO ASSAY	
		28.0	24.8	3.2	100		/	/		NO ASSAY	
33-8		24.8	23.7	1.1	100		/	/		.56	
33-7		23.7	21.6	2.1	100		/	/		1.96	
33-6		21.6	20.0	1.6	100		/	/		.42	
		20.0	11.0	9.0	100		/	/		NO ASSAY	
33-5		11.0	9.3	1.7	100		/	/		1.29	
33-4		9.3	7.2	2.1	100	K	/	/		5.94	
33-3		7.2	5.0	2.2	100	K	/	/		6.16	
33-2		5.0	3.3	1.7	100	K	/	/		1.04	
33-1		3.3	-.0	3.3	100	K	/	/		2.43	
		-.0	-5.0	5.0	100	K	/	/		2.96	
		-5.0	-11.7	6.7	100	K	/	/		2.46	
		-11.7	-14.5	2.8	100	K	/	/		0.00	0.00
32-1		-14.5	-18.3	3.8	100	K	/	/		1.56	0.00
32-2		-18.3	-20.4	2.1	100	K	/	/		4.86	0.00
32-3		-20.4	-23.2	2.8	100	K	/	/		7.86	1.66
32-4		-23.2	-25.5	2.3	100	K	/	/		9.24	0.00
32-5		-25.5	-28.0	2.5	100	K	/	/		4.34	0.00
32-6		-28.0	-31.7	3.7	100	K	/	/		4.30	0.00
32-7		-31.7	-33.5	1.8	100	K	/	/		3.66	.76
32-8		-33.5	-34.0	.5	100	K	/	/		3.66	0.00
32-9		-34.0	-35.2	1.2	100	K	/	/		36	0.00

DIAMOND DRILL LOG / CHIP SAMPLE REPORT

COMPANY DRILL-HOLE NUMBER 77032 MEG DRILL-HOLE NUMBER ZZX0038
COMBINE WITH DRILL-HOLE ZZX0039

ALL GRADES ARE GIVEN IN LBS/TON UNLESS SPECIFIED
CODES FOR OTHER METALS AS CODED ON MEG0401 900000000
AU OZ/TON

SAMPLE #	DISTANCE FROM COLLAR	SAMPLE LENGTH	AM	CM	GRADE	AM	CM	GRADE	AM	CM	GRADE	AM	CM	GRADE
33-18	135.6	2.9	D	A	.04			0.00			0.00			0.00
33-17	85.5	1.4	D	A	.02			0.00			0.00			0.00
33-16	84.1	1.2	D	A	.15			0.00			0.00			0.00
33-15	82.9	2.9	D	A	.41			0.00			0.00			0.00
33-14	80.0	2.4	D	A	.42			0.00			0.00			0.00
33-13	77.6	.9	D	A	.00			0.00			0.00			0.00
33-12	75.0	.9	D	A	.13			0.00			0.00			0.00
33-12	74.1	1.6	D	A	.13			0.00			0.00			0.00
33-12	72.5	1.7	D	A	.13			0.00			0.00			0.00
33-11	67.3	.8	D	A	.18			0.00			0.00			0.00
33-10	64.9	.8	D	A	.29			0.00			0.00			0.00
33-9	64.1	1.9	D	A	.03			0.00			0.00			0.00
33-8	24.8	1.1	D	A	.02			0.00			0.00			0.00
33-7	23.7	2.1	D	A	.07			0.00			0.00			0.00
33-6	21.6	1.6	D	A	.01			0.00			0.00			0.00
33-5	11.0	1.7	D	A	.04			0.00			0.00			0.00
33-4	9.3	2.1	D	A	.20			0.00			0.00			0.00
33-3	7.2	2.2	D	A	.21			0.00			0.00			0.00
33-2	5.0	1.7	D	A	.04			0.00			0.00			0.00
33-1	3.3	3.3	D	A	.08			0.00			0.00			0.00
	-.0	5.0	D	A	.10			0.00			0.00			0.00
	-5.0	6.7	D	A	.08			0.00			0.00			0.00

DIAMOND DRILL LOG / CHIP SAMPLE REPORT

COMPANY DRILL-HOLE NUMBER	77032				
SPECIAL DRILL-HOLE ID		DEPARTURE	7600.0	HOLE DIP	0
NEG DRILL-HOLE NUMBER	ZZX0038	LATITUDE	8540.0	HOLE AZIMUTH	180
COMBINE WITH DRILL-HOLE	ZZX0039	ELEVATION	1210.5	DRILLING STARTED	77/10/15
DDH SYMBOL	AXT	HOLE LENGTH	244.3	DRILLING FINISHED	77/10/15
LOCATION/COMMENT	UNDERGROUND HOLE • 200 LEVEL • K ZONE				

SAMPLE NO.	MISSING SEGM.	FOOTAGE FROM	FOOTAGE TO	WIDTH	PERC. RECOV.	REEF	GEOLOGICAL DESCRIPTION ROCK TYPE	MINERALIZATION	CHARACTERISTICS	U3O8 LBS/TON	THO2 LBS/TON
32-10		-35.2	-36.7	1.5	100	K	/	/		.16	0.00
32-11		-36.7	-38.4	1.7	100	K	/	/		3.08	.64
32-12		-38.4	-39.7	1.3	100	K	/	/		3.08	0.00
32-13		-39.7	-40.6	.9	100		/	/		.98	0.00
32-14		-40.6	-41.7	1.1	100		/	/		.98	0.00
32-15		-41.7	-43.5	1.8	100		/	/		1.74	.36
32-16		-43.5	-45.2	1.7	100		/	/		.62	0.00
		-45.2	-46.4	1.2	100		/	/		0.00	0.00
		-46.4	-50.0	3.6	100		/	/		0.00	0.00
		-50.0	-72.2	22.2	100		/	/		0.00	0.00

REFERENCES

1. Boyle, R., "Program MEG1000 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-96(TR), CANMET, Energy, Mines and Resources Canada; 1982.

2. Boyle, R., "Program MEG1600 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-99(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

2. The computer programs from the CADD and GEM systems have been created using Control Data FORTRAN level 4.8 and COBOL level 4.7. CANMET does not guarantee that these programs can be run on any given computer without transformations.

3. The computer programs of CADD and GEM systems are protected by Crown Copyright.

LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
Ottawa (Ontario)
K1A 0G1
Téléphone: (613) 995-4029

Dénis de responsabilité

1. Au meilleur de la connaissance des auteurs, les programmes d'ordinateur des systèmes CADD et GEM opéreront comme ils sont présentés, mais ni les auteurs, ni le CANMET n'offrent de garantie, expressément ou implicitement, quant à l'état complet de la documentation ou à la performance du programme.

2. Les programmes d'ordinateur des systèmes CADD et GEM sont écrits en FORTRAN (CDC, Level 4.8) et COBOL (CDC, Level 4.7). Le CANMET ne garantit pas que ces programmes peuvent être passés sur n'importe quel ordinateur sans effectuer des transformations.

3. Les programmes d'ordinateur de systèmes CADD et GEM sont protégés en vertu du droit d'auteur de la Couronne.

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CANMET

Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG1600 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle

Mine Evaluation Group

October 1982

This document is an unedited interim report prepared primarily for discussion and internal use purposes. It does not represent a final expression of the opinion of the Canada Centre for Mineral and Energy Technology (CANMET)

Ce document est un rapport provisoire non-révisé et rédigé principalement pour fin de discussion et de documentation interne. Il ne représente nullement l'expression définitive de l'opinion du Centre canadien de la technologie des minéraux et de l'énergie (CANMET)

21 pp

ENERGY RESEARCH PROGRAM

MINING RESEARCH LABORATORIES

DIVISION REPORT ERP/MRL 82-99(TR)

PROGRAM MEG1600 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG1600 is to combine a maximum of three underground drillholes into one continuous drillhole. Drillholes to be combined must have adjacent MEG drillhole numbers.

The input file of MEG1600 must be provided by MEG1000. The output file of MEG1600 is similar to MEG1000 converted master file.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

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GUIDE D'USAGER POUR LE PROGRAMME MEG1600
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG1600 est de combiner un maximum de trois forages souterrains en un seul. Les forages à être réunis doivent avoir des numéros de série MEG qui se suivent.

Le fichier d'entrée de MEG1600 est fourni par MEG1000. Le fichier de sortie de MEG1600 est semblable au fichier maître transformé MEG1000.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
      SUBROUTINE MEG1600(DSAMPL,DSM,DDIPI,DAZIMI,IRC,IRT,DCOREC,DDFC,
     -                   SVELEV,DALOS,DTLOS,DDIP,DAZIM,DRDENS,SVDEPT,
     -                   SVLATIT,IAM,ICM,DGRADE,DMO,K1)
C*
C*
C*************************************************************************
C*                                                                       *
C******GENERAL DESCRIPTION                                               *
C*                                                                       *
C*     PROGRAM MEG1600 IS USED TO COMBINE A MAXIMUM OF 3 UNDERGROUND     *
C*     DRILL-HOLES INTO ONE DRILL-HOLE. THE FILE OTFILE (TAPE3) WHICH    *
C*     IS CREATED BY MEG1600 HAS THE SAME FORMAT AS THE OUTPUT FILE      *
C*     MEG1000. MEG1600 READS DATA FROM INFILE (TAPE3) AND COMBINES      *
C*     DRILLHOLES IF NECESSARY. FILE INFILE WAS CREATED BY PROGRAM       *
C*     MEG1000. COMBINED DRILLHOLES ARE WRITTEN TO FILE OTFILE (TAPE4)   *
C*     AND PASSED TO PROGRAMS MEG1500, MEG0100, MEG3000, MEG2040 FOR     *
C*     FURTHER PROCESSING. THIS PROGRAM WAS WRITTEN IN CDC FORTRAN       *
C*     LEVEL 4.8 AND WAS ORIGINALLY CREATED BY JIRI FOLTA AND            *
C*     SUBSEQUENTLY MODIFIED BY RUSSELL BOYLE, (EMR, CANMET, MRL),       *
C*     MAY 1982.                                                         *
C*                                                                       *
C*************************************************************************
C*
C*
C*************************************************************************
C*                                                                       *
C******CARD READ ON INPUT                                                *
C*                                                                       *
C*     CARD 1 - PSER,PSTARS,PTYPE,PSORT,PGH                              *
C*              FORMAT(R3,R4,2R1,I1)                                     *
C*          PSER   - MEG SERIES                                          *
C*          PSTARS - 4 ASTERISKS ****                                    *
C*          PTYPE  - PROJECTION COMPUTED FOR THE ADDED SEGMENT TO THE    *
C*                   COMBINED DRILL-HOLE. THE SAME PROJECTION AS         *
C*                   MEG1000 SHOULD BE SPECIFIED.                        *
C*                   A APPARENT                                          *
C*                   H HORIZONTAL                                        *
C*                   V VERTICAL                                          *
C*                   T TRUE                                              *
C*          PSORT  - SORTING OF DRILL-HOLES BEFORE COMBINATION           *
C*                   D DEPARTURE (EAST-WEST SORT)                        *
C*                   L LATITUDE (NORTH-SOUTH SORT)                       *
C*                   E ELEVATION (ELEVATION SORT)                        *
C*                   THIS OPTION PLACES THE 3 DRILLHOLES IN THEIR        *
C*                   PROPER POSITION BEFORE THEY ARE COMBINED.           *
C*          PGH    - NUMBER OF ZONE/ROCK TYPES (MAXIMUM OF 5)           *
C*                   THIS OPTION IS USED TO STORE ONE OF DEPARTURE,      *
C*                   LATITUDE OR ELEVATION ON THE TITLE RECORD OF FILE   *
C*                   MEG1600. THIS OPTION ONLY APPLIES WHEN DRILL-HOLES  *
C*                   ARE TO BE COMBINED. PGH AND CARD TWO SHOULD         *
C*                   CORRESPOND TO THE SAME OPTIONS SPECIFIED IN         *
C*                   PROGRAM MEG1000.                                    *
C*     CARD 2 - PRERO(I),PBE(I),PXYZ(I),PHOR(I)                          *
C*              FORMAT(R4,1X,R1,4X,R1,4X,R3)                             *
C*              THIS CARD IS REPEATED PGH TIMES (MAX OF 5 TIMES).        *
C*              DO NOT SPECIFY CARD 2 WHEN PGH IS 0                      *
C*              THIS OPTION IS USED TO STORE ONE OF DEPARTURE,           *
```

```
C*            LATITUDE OR ELEVATION COORDINATE ON THE TITLE RECORD    *
C*            OF FILE MEG1000. THE COORDINATE IS SELECTED FROM THE    *
C*            ROCK TYPE AND/OR ZONE (REEF) CODE. THE END OR BEGINNING *
C*            OF THE SEGMENT COORDINATE CAN ALSO BE SPECIFIED.        *
C*            THE INFORMATION PROVIDED BY USING THIS OPTION CAN       *
C*            OPTIONALLY BE USED BY PROGRAM MEG3000.                  *
C*      PRERO - ARRAY IDENTIFYING THE GEOLOGICAL FEATURE WHICH        *
C*              WILL BE USED AS AN HORIZON                            *
C*              IF PRERO=ROCK THE SEARCH IS PERFORMED WITH THE        *
C*              ROCK TYPE (2 FIRST CHARACTERS OF ROCK CODE).          *
C*              IF PRERO=REEF THE SEARCH IS PERFORMED WITH THE        *
C*              ZONE (REEF) CODE (3 CHARACTERS).                      *
C*      PBE   - ARRAY INDICATING THE END OR BEGINNING OF SEGMENT      *
C*              OR ROCK/ZONE PHOR(I) IS STORED ON FILE TAPE3          *
C*              IF PBE(I)=E END COORDINATE OF LAST SEGMENT OF         *
C*              ROCK/ZONE PHOR(I).                                    *
C*      PXYZ  - ARRAY INDICATING THE COORDINATE TO BE STORED ON       *
C*              FILE TAPE3 TITLE RECORD (MEG1000) (MAXIMUM OF 5)      *
C*              IF PXYZ(I)=X DEPARTURE COORDINATE IS STORED           *
C*              IF PXYZ(I)=Y LATITUDE COORDINATE IS STORED            *
C*              IF PXYZ(I)=Z ELEVATION COORDINATE IS STORED           *
C*      PHOR  - ARRAY INDICATING ZONE/ROCK REPRESENTING A             *
C*              GEOLOGICAL FEATURE                                    *
C*              ONLY THE 2 FIRST CHARACTERS ARE TO BE USED FOR ROCK   *
C*              TYPE. PHOR REPRESENTING A ROCK TYPE SHOULD BE CODED   *
C*              ON INPUT IN THE 2 FIRST COLUMNS.                      *
C*              ALL 3 CHARACTERS ARE TO BE USED FOR ZONE CODE.        *
C*                                                                    *
C**********************************************************************
C*
C*
C**********************************************************************
C*
C******FILES                                                          *
C*                                                                    *
C*      TAPE1  INPUT DATA CARDS                                       *
C*      TAPE2  OUTPUT LISTING                                         *
C*             SECTION 1 OPTIONS APPLIED                              *
C*             SECTION 2 RESULTS AND SUMMARY                          *
C*      TAPE3  (INFILE) MEG1000 FILE                                  *
C*      TAPE4  (OTFILE) MEG1600 FILE                                  *
C*             TAPE3 AND TAPE4 ARE UNFORMATED FILES.                  *
C*             TAPE3 AND TAPE4 ARE DESCRIBED IN THE DOCUMENTATION OF  *
C*             MEG1000.                                               *
C*                                                                    *
C**********************************************************************
C*
C*
C**********************************************************************
C*
C******REQUIRED SUBROUTINES                                           *
C*                                                                    *
C*      MEG1601 - INITIALIZATION OF FILES                             *
C*      MEG1602 - READS DRILLHOLES TO COMBINE AND WRITES COMBINED     *
C*                DRILLHOLES                                          *
C*      MEG1603 - DETERMINES POSITION OF DRILLHOLES WITH RESPECT TO   *
C*                SORT                                                *
```

```
C*      MEG1604 - COMBINES DRILLHOLES                                  *
C*      MEG1605 - SOLVES A 3 BY 3 DETERMINENT                          *
C*                                                                     *
C*********************************************************************
C*
C*
C*********************************************************************
C*
C******VARIABLE NAMES                                                 *
C*                                                                     *
C*      DSAMPL  SAMPLE NUMBER OF SEGMENT                               *
C*      DSM     SAMPLING METHOD OF SEGMENT                             *
C*      DDIPI   DIP OF SEGMENT IN DEGREES                              *
C*      DAZIMI  AZIMUTH OF SEGMENT IN DEGREES                          *
C*      IRC     ZONE CODE OF SEGMENT                                   *
C*      IRT     ROCK CODE OF SEGMENT                                   *
C*      DCOREC  CORE RECOVERY OF SEGMENT                               *
C*      DDFC    DISTANCE FROM COLLAR OF SEGMENT                        *
C*      SVELEV  ELEVATION OF START OF SEGMENT                          *
C*      DALOS   PROJECTED LENGTH OF SEGMENT                            *
C*      DDIP    DIP OF SEGMENT IN RADIANS                              *
C*      DAZIM   AZIMUTH OF SEGMENT IN RADIANS                          *
C*      DRDENS  DENSITY OF SEGMENT                                     *
C*      SVDEPT  DEPARTURE OF START OF SEGMENT                          *
C*      SVLATIT LATITUDE OF START OF SEGMENT                           *
C*      IAM     ASSAYING METHOD OF SEGMENT                             *
C*      ICM     COMPUTING METHOD OF SEGMENT                            *
C*      DGRADE  ARRAY REPRESENTING GRADES OF URANIUM, THORIUM AND 5    *
C*              METALS                                                 *
C*      DMO     MINED OUT CODE                                         *
C*              THESE VARIABLES ARE THE SAME AS DESCRIBED IN PROGRAM   *
C*              MEG1000.                                               *
C*                                                                     *
C*                                                                     *
C*********************************************************************
C*
C*
C*********************************************************************
C*
C******VARIABLE DIMENSIONS                                            *
C*                                                                     *
C*      K1 - GREATEST NUMBER OF SEGMENTS IN ONE DRILLHOLE TO BE        *
C*           PROCESSED                                                 *
C*                                                                     *
C*********************************************************************
C*
C*
C*********************************************************************
C*
C******EXECUTION                                                      *
C*                                                                     *
C*      H1600,CM130000,T250,IO400,P2.                                  *
C*      ACCOUNT,*****.                                                 *
C*      ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=****,MR=1.                *
C*      BEGIN,CADD,PROCD,PROGRAMIN=MEG1600.                            *
C*      PFNI= PERMANENT NAME OF INPUT FILE MEG1000.                    *
C*      PFNO= PERMANENT NAME OF OUTPUT FILE MEG1600.                   *
```

```
                73/74   OPT=1                                   FTN 4.8+528

C*      Q1= MAXIMUM NUMBER OF SEGMENTS.
C*
C*****************************************************************************
C*
C*
C*****************************************************************************
C*
C******DECLARATIONS
C*
C*****************************************************************************
C*
C*
      INTEGER CSER,CDATE,TSKP,TNSEG,TDIP,TAZIM,PSER,PSTARS,CSTARS,TUDN,
     -        TCONTI,PTYPE,PSORT
      INTEGER DSAMPL(K1,3),DSM(K1,3),DDIPI(K1,3),DAZIMI(K1,3),
     -        IRC(K1,3),IRT(K1,3),DCOREC(K1,3),IAM(K1,3,7),ICM(K1,3,7),
     -        DMO(K1,3)
      REAL    DDFC(K1,3),SVELEV(K1,3),DALOS(K1,3),DTLOS(K1,3),DDIP(K1,3)
     -       ,DAZIM(K1,3),DRDENS(K1,3),SVDEPT(K1,3),SVLATIT(K1,3),
     -        DGRADE(K1,3,7)
      INTEGER PRERO(5),PBE(5),PXYZ(5),PHOR(5),PGH
C*
C******COMMON AREAS
C*
      COMMON /TITL/ TSKP(27),TCONTI,TLENGT(3),TNSEG(3),TDIP(3),TAZIM(3),
     -     TUDN(3),JUMP(2),INUB,TCORD(3),IXYZ
      COMMON /PARM/ PSER,PSTARS,CSER,CSTARS,CDATE,PDATE,PTYPE,PSORT
      COMMON /CNTS/ IREAD,IALONE,ICOMBI,IRESLT,IWRITN,ILINE,IPAGE
      COMMON /GHOR/ PRERO,PBE,PXYZ,PHOR,PGH
C*
C*
C*****************************************************************************
C*
C******PROGRAM BODY
C*
C*****************************************************************************
C*
C*
C******INITIALIZE
C*
      CALL MEG1601
C*
C******READ DRILL-HOLES AND COMBINE THEM IF NECESSARY
C*
    5 READ(3) TUDN(1),TSKP(1),TCONTI,(TSKP(I),I=2,3),TLENGT(1),TNSEG(1),
     -        TDIP(1),TAZIM(1),(TSKP(I),I=4,27),TCORD(1),IXYZ
      IF(EOF(3)) 100,10
C*
C******READ DETAIL RECORDS
C*
   10 NSEG=TNSEG(1)
      IREAD=IREAD+1
      DO 15 I=1,NSEG
   15 READ(3) DSAMPL(I,1),DSM(I,1),DDIPI(I,1),DAZIMI(I,1),IRC(I,1),
     -        IRT(I,1),DMO(I,1),
     -        DCOREC(I,1),DDFC(I,1),SVELEV(I,1),DALOS(I,1),DTLOS(I,1),
     -        DDIP(I,1),DAZIM(I,1),DRDENS(I,1),SVDEPT(I,1),SVLATIT(I,1),
```

CHAPTER 2.0

BLANK OPTION CARD SHEET(S)

MEG1600 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1

PSER	PSTARS	PTYPE	PSORT	PGH
1 3	4 7	8	9	10
[ ][ ][ ]	[ ][ ][ ][ ]	[ ]	[ ]	[ ]

CARD NO. 2

PRERO(I)	PBE(1)	PXYZ(I)	PHOR(I)	REPEATED PGH TIMES (MAXIMUM OF 5)
1 — 4	6	11	16 — 18	
[ ][ ][ ][ ]	[ ]	[ ]	[ ][ ][ ]	
[ ][ ][ ][ ]	[ ]	[ ]	[ ][ ][ ]	
[ ][ ][ ][ ]	[ ]	[ ]	[ ][ ][ ]	
[ ][ ][ ][ ]	[ ]	[ ]	[ ][ ][ ]	
[ ][ ][ ][ ]	[ ]	[ ]	[ ][ ][ ]	

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPA,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1600,
PFNI=                          , (PERMANENT FILE NAME OF OUTPUT FILE (MEG1000))
PFNO=                          , (PERMANENT FILE NAME OF OUTPUT FILE (MEG1600)).
Q1=                            . (DIMENSION VARIABLES).
```

CHAPTER 3.0
EXECUTION OF THE PROGRAM WITH TEST DATA

MEG1600 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R. Bayle

CARD NO. 1

PSER	PSTARS	PTYPE	PSORT	PGH
1 3	4 7	8	9	10
22X	****	A	4	0

CARD NO. 2

PRERO(I)	PBE(1)	PXYZ(I)	PHOR(I)
1——4	6	11	16—18

REPEATED PGH TIMES (MAXIMUM OF 5)

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPA,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1600,
PFNI=MEG1000ZZX          , (PERMANENT FILE NAME OF OUTPUT FILE (MEG1000))
PFNO=MEG1600ZZX          , (PERMANENT FILE NAME OF OUTPUT FILE (MEG1600)).
Q1=200                   . (DIMENSION VARIABLES).
```

```
      PROGRAM GEM1600(INPUT,OUTPUT,INFILE,OTFILE,TAPE1=INPUT,
     -                TAPE3=INFILE,TAPE4=OTFILE,TAPE2=OUTPUT)
      INTEGER DSAMPL(150,3),DSM(150,3),DDIPI(150,3),
     -        DAZIMI(150,3),IRC(150,3),IRT(150,3),
     -        DCOREC(150,3),IAM(150,3,7),ICM(150,3,7),
     -        DMO(150,3)
      REAL DDFC(150,3),SVELEV(150,3),DALOS(150,3),
     -     DDIP(150,3),DTLOS(150,3),DAZIM(150,3),
     -     DRDENS(150,3),SVDEPT(150,3),SVLATIT(150,3),
     -        DGRADE(150,3,7)
C*    K1 IS THE NUMBER OF SEGMENT IN THE COMBINED DDW.
      K1=150
      CALL MFG1600(DSAMPL,DSM,DDIPI,DAZIMI,IRC,IRT,DCOREC,DDFC,
     -             SVELEV,DALOS,DTLOS,DDIP,DAZIM,DRDENS,SVDEPT,
     -             SVLATIT,IAM,ICM,DGRADE,DMO,K1)
      STOP
      END
```

SECTION 1 OPTIONS APPLIED

CARD	OPTION		DESCRIPTION
1	PSER	ZZx	MFG SERIES ASSIGNED TO A DEPOSIT
	PSTARS	****	4 ASTERIKS ****
	PTYPE	A	TYPE OF PROJECTION SAME AS PROGRAM MFG1000 A APPARENT PROJECTION H HORIZONTAL PROJECTION T TRUE PROJECTION V VERTICAL PROJECTION
	PSORT	L	THE SPECIFIED DRILLHOLES ARE SORTED BEFORE THEY ARE COMBINED D DEPARTURE SORT E ELEVATION SORT L LATITUDE SORT
	PGH	0	NUMBER (MAX OF 5) OF ZONE/ROCK TYPES FROM WHICH ONE OF DEPARTURE LATITUDE OR ELEVATION IS STORED ON FILE MEG1000 (MFG1000 THIS OPTION IS USED FOR SELECTING A SPECIFIC GEOLOGICAL STRATA, FORMATION (FEATURE)

R1600 COMBINATION OF DRILL-HOLES FOR SERIES ZZX CREATED 21/12/82 TODAYS DATE 21/12/82 PAGE 1

THE FOLLOWING DRILL-HOLES HAVE BEEN COMBINED

ZZX0038 ZZX0039

A1600 COMBINATION OF DRILL-HOLES FOR SERIES ZZX CREATED 21/12/82 TODAYS DATE 21/12/82

DRILL-HOLES READ	3	
STAND-ALONE DRILL-HOLES WRITTEN	1	
DRILL-HOLES MERGED 2 TO GIVE	1	DRILL-HOLES
TOTAL DRILL-HOLES WRITTEN	2	

REFERENCES

1. Boyle, R., "Program MEG1000 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-96(TR), CANMET, Energy, Mines and Resources Canada; 1982.

APPENDIX A

CANADA CENTRE FOR MINERAL AND ENERGY TECHNOLOGY

Mining Research Laboratories

ANNOUNCEMENT

Public access to CANMET's systems for mineral reserve evaluation

---

Two computer program systems have been created by the Mine Evaluation Group (MEG) of MRL, CANMET, EMR, since 1975, for the purpose of reserves evaluation. These systems were developed principally for the evaluation of uranium reserves but can also be used to evaluate other mineral resources.

The CADD system (Coding and Analysis of Drillhole Data) is used to enter, edit and prepare basic drillhole data to be used subsequently for the evaluation of reserves. The GEM system (Geostatistical Evaluation of Mines) is a group of computer programs allowing variogram analyses and kriging estimations.

The CADD and GEM systems include twenty-five FORTRAN and COBOL computer programs which can: prepare drill log reports; calculate economical composite intersections; draw projections of drillholes on sections or plans; calculate experimental variograms; and find the best theoretical model; perform kriging evaluations as well as conventional type evaluation; and draw isocurves.

The CADD and GEM Systems for Mineral Reserve Evaluation are now available to the public on a magnetic tape at a cost of ($500) five hundred dollars (Canadian).

For more information concerning the availability of CANMET Systems for Mineral Reserve Evaluation, contact:

Mineral Technology Information Officer
Technology Information Division
CANMET
Energy, Mines and Resources Canada
555 Booth Street
Ottawa, Ontario
K1A 0G1
Telephone: (613) 995-4029

Disclaimers

1. To the best knowledge of the authors, the computer programs from the CADD and GEM systems will operate as represented but neither the authors nor CANMET give any warranty, expressed or implied, as to the completeness of the documentation, or performance of the program.

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LE CENTRE CANADIEN DE LA TECHNOLOGIE DES MINÉRAUX ET DE L'ÉNERGIE

Laboratoires de recherche minière

ANNONCE

L'accès du public aux systèmes du CANMET pour l'évaluation des réserves en minéraux

Depuis 1975, deux systèmes de programmes d'ordinateur ont été créés par le MEG (Mine Evaluation Group) les LRM du CANMET, EMR, dans le but de l'évaluation des réserves. Ces systèmes furent principalement développés pour l'évaluation des réserves d'uranium, mais ils peuvent également être utilisés pour d'autres ressources minérales.

Le système CADD (Coding and Analysis of Drillhole Data) est utilisé pour entrer, réviser et préparer des analyses de trous de forage, dans le but de les utiliser par la suite pour l'évaluation des réserves. Le système GEM (Geostatistical Evaluation of Mines) est un groupe de programmes d'ordinateur permettant d'effectuer des analyses de variogramme et des évaluations de krigeage. Les systèmes CADD et GEM comprennent vingt-cinq programmes d'ordinateur en FORTRAN et en COBOL, lesquels peuvent préparer des rapports d'inventaires de forage, faire des projections économiques, faire des projections sur les trous de forage sur des plans ou des sections, calculer des variogrammes expérimentaux, trouver le meilleur modèle théorique, effectuer des évaluations de krigeage, de même que des évaluations de type conventionnel, et dessiner des courbes de niveau.

Les systèmes CADD et GEM pour l'évaluation des ressources minérales sont maintenant disponibles au public sur ruban magnétique, pour la somme de cinq cents dollars ($500), en argent canadien.

Pour de plus amples renseignements concernant les systèmes du CANMET pour l'évaluation des réserves minérales, veuillez communiquer avec:

L'agent d'information sur la technologie minière
Division de l'information technologique
CANMET
Energie, Mines et Ressources, Canada
555, rue Booth
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K1A 0G1
Téléphone: (613) 995-4029

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Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

PROGRAM MEG1650 USER'S GUIDE - CADD SYSTEM - CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION

VERSION I

R. Boyle

Mine Evaluation Group

October 1982

This document is an unedited internal report prepared to ... for the ... of the Department of Energy, Mines and Resources (CANMET)

... rapport ... réduit ... pour fin de ... communication ... nulle ... définitive de ... Bureau canadien de la technologie des minéraux et de l'énergie (CANMET)

16 pp

ENERGY RESEARCH PROGRAM

MINING RESEARCH LABORATORIES

DIVISION REPORT ERP/MRL 82-100(TR)

PROGRAM MEG1650 USER'S GUIDE - CADD SYSTEM
CANMET SYSTEMS FOR MINERAL RESERVE EVALUATION
VERSION I

by

R. Boyle*

ABSTRACT

The purpose of program MEG1650 is to merge two MEG1000 files. A MEG1600 file is the MEG1000 file type.

MEG1650 allows the addition of new drillholes to an existing MEG1000 or MEG1600 converted master file. It avoids re-executing completly a MEG0401 new master file.

The input file of MEG1650 is provided by either MEG100 or MEG1600. The output file of MEG1650 is similar to a MEG100 converted master file.

The documentation of this program is technical and is subject to further verification and revision. However, the information conveyed by this report is of sufficient value to merit public distribution.

---

*Computer Scientist, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa.

GUIDE D'USAGER POUR LE PROGRAMME MEG1650
SYSTÈME CADD - SYSTÈMES CANMET POUR L'ÉVALUATION DES RÉSERVES MINÉRALES
VERSION I

R. Boyle*

RÉSUMÉ

Le but du programme MEG1650 est de réunir deux fichiers maîtres transformés MEG1000. Un fichier créé par MEG1600 est aussi un fichier maître transformé du type MEG1000. MEG1650 permet d'ajouter de nouveaux forages à un fichier maître transformé MEG1000 sans avoir à réexécuter pour tous les forages la procédure depuis la création du fichier maître MEG0401.

Le fichier d'entrée de MEG1650 est fourni par MEG1000 ou MEG1600. Le fichier de sortie de MEG1650 est semblable à un fichier maître transformé MEG1000.

La documentation de ce programme est technique et peut avoir à subir des vérifications et faire l'objet de révision. Cependant, on croit que l'information contenue dans ce rapport est suffisamment valable pour faire l'objet de diffusion au public.

---

*Programmeur, Laboratoires de recherches minières, Centre canadien de la technologie des minéraux et de l'énergie (CANMET), Energie, Mines et Ressources, Canada, Ottawa.

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CHAPTER 1.0
GENERAL DOCUMENTATION

```
                73/74   OPT=1                          FTN 4.8+528          01

      PROGRAM MEG1650(INPUT,OUTPUT,TAPE1,TAPE2,TAPE3,TAPE5=INPUT,
     -                TAPE6=OUTPUT)
C*
C*
C*****************************************************************************
C*                                                                            *
C*******GENERAL DESCRIPTION                                                   *
C*                                                                            *
C*      THIS PROGRAM MERGES TWO FILES (TAPE1, TAPE2) OF MEG1000 AND/OR        *
C*      MEG1600 TO CREATE A NEW MASTER FILE (TAPE3). THE FILES                *
C*      (TAPE1 AND TAPE2) HAVE BEEN SORTED BY PREVIOUS PROGRAM RUNS.          *
C*      THE RESULTING FILE (TAPE3) CONTAINS ALL DRILLHOLES FROM TAPE1         *
C*      AND TAPE2. DUPLICATE MEG DRILLHOLE NUMBERS ON FILES TAPE1 AND         *
C*      TAPE2 WILL RESULT IN A FATAL ERROR. THIS PROGRAM WAS WRITTEN IN       *
C*      CDC FORTRAN LEVEL 4.8 AND WAS ORIGINALLY CREATED BY RUSSELL           *
C*      BOYLE (EMR, CANMET, MRL), MAY 1982.                                   *
C*                                                                            *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                            *
C*******OPTIONS READ ON INPUT                                                 *
C*                                                                            *
C*      CARD 1 - ISER5                                                        *
C*               FORMAT(R3)                                                   *
C*           ISER5  -MEG SERIES ASSIGNED TO DEPOSIT. THE SERIES ON TAPE1      *
C*                   AND TAPE2 MUST CORRESPOND TO ISER5.                      *
C*                                                                            *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                            *
C*******FILES                                                                 *
C*                                                                            *
C*      TAPE1  MEG1000 OR MEG1600 FILE TO WHICH TAPE2 IS TO BE MERGED         *
C*      TAPE2  MEG1000 OR MEG1600 FILE WHICH IS TO BE MERGED TO TAPE1         *
C*             FILES TAPE1 AND TAPE2 ARE UNFORMATED FILES.                    *
C*      TAPE3  MEG1000 OR MEG1600 MERGED FILE CREATED FROM TAPE1 AND          *
C*             TAPE2.                                                         *
C*      TAPE5  INPUT DATA CARD                                                *
C*      TAPE6  OUTPUT LISTING                                                 *
C*             SECTION 1 OPTIONS APPLIED AND RESULTS                          *
C*                                                                            *
C*****************************************************************************
C*
C*
C*****************************************************************************
C*                                                                            *
C*******REQUIRED SUBROUTINES                                                  *
C*                                                                            *
C*      MEG1651 - INITIALIZES                                                 *
C*      MEG1652 - READS MEG TITLE RECORDS                                     *
C*      MEG1653 - WRITES MEG TITLE RECORDS                                    *
C*      MEG1654 - READS AND WRITES MEG SEGMENT RECORDS                        *
C*      MEG1655 - ABORTS THE JOB                                              *
```

73/74 OPT=1 FTN 4.8+528

```
      C*      MEG1656 - PRINTS THE SUMMARY
      C*
      C*************************************************************************
      C*
      C*
      C*************************************************************************
      C*
      C******EXECUTION
      C*
      C*      H1650,CM60000,T200,IO400,P2.
      C*      ACCOUNT,*****.
      C*      ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=****,MR=1.
      C*      BEGIN,CADD,PROCD,PROGRAMIN=MEG1650.
      C*      PFNI = PERMANENT FILE NAME INPUT MEG1000 OR MEG1600.
      C*      PFNI2= PERMANENT FILE NAME INPUT MEG1000 OR MEG1600.
      C*      PFNO = PERMANENT FILE NAME OUTPUT (MERGED FILE).
      C*
      C*************************************************************************
      C*
      C*
      C*************************************************************************
      C*
      C******DECLARATIONS
      C*
      C*************************************************************************
      C*
      C*
            INTEGER ISKP1(31),ISKP2(31)
            INTEGER EOF1,EOF2
      C*
      C*
      C******COMMON AREAS
      C*
      C*
            COMMON /SER/ ISER5,ISER1,ISER2
            COMMON /TIT1/ ISKP1,TLENGT1 ,ISEG1,TCORD1,IUDN1
            COMMON /TIT2/ ISKP2,TLENGT2,ISEG2,TCORD2,IUDN2
            COMMON /EOF12/ EOF1,EOF2
            COMMON /RESH/ INH1,INH2
      C*
      C*
      C*************************************************************************
      C*
      C******PROGRAM BODY
      C*
      C*************************************************************************
      C*
      C*
            READ(5,900) ISER5
            READ(1) ISER1,ISTAR1,IDAT1
            READ(2) ISER2,ISTAR2,IDAT2
            EOF1=EOF2=INH1=INH2=0
            CALL MEG1651
            WRITE(3) ISER1,ISTAR1,IDAT1
            ICAS=0
            CALL MEG1652(1,ICAS)
            CALL MEG1652(2,ICAS)
```

CHAPTER 2.0
BLANK OPTION CARD SHEET(S)

MEG1650 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE _____
PAGE 1 OF 1
NAME _____

CARD NO. 1

ISER5

1 3

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1650,
PFNI=                              , (PERMANENT FILE NAME OF INPUT FILE (MEG1000 OR MEG1600))
PFNI2=                             , (PERMANENT FILE NAME OF INPUT FILE (MEG1000 OR MEG1600))
PFNO =                             . (PERMANENT FILE NAME OF OUTPUT MERGED FILE).
```

CHAPTER 3.0

EXECUTION OF THE PROGRAM WITH TEST DATA

MEG1650 - OPTION CARDS

VERSION NO. 1
MAY, 1982

DATE May, 1982
PAGE 1 OF 1
NAME R. Boyle

CARD NO. 1

ISER5
1 3
22X

EXECUTION

```
ATTACH,PROCD,MEGEXECCADD,ID=MEGPR,PW=***,MR=1.
BEGIN,CADD,PROCD,PROGRAMIN=MEG1650,
PFNI= MEG1600 22X                    , (PERMANENT FILE NAME OF INPUT FILE (MEG1000 OR MEG1600))
PFNI2=MEG1000 22X TO MERGE           , (PERMANENT FILE NAME OF INPUT FILE (MEG1000 OR MEG1600))
PFNO =MEG1600 22X MERGED             . (PERMANENT FILE NAME OF OUTPUT MERGED FILE).
```

SECTION 1 OPTIONS APPLIED AND RESULTS

CARD	OPTIONS		DESCRIPTION
1	ISERS	ZZX	MEG SERIES ASSIGNED TO A DEPOSIT

MEG DDH NUMBER ON TAPE1 IS ZZX0009
MEG DDH NUMBER ON TAPE2 IS ZZX0009
JOB ABORT
MASTER FILE TAPE1 AND MERGE FILE TAPE2 HAVE THE SAME MEG DDH NUMBER

REFERENCES

1. Boyle, R., "Program MEG1000 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-96(TR), CANMET, Energy, Mines and Resources Canada; 1982.

2. Boyle, R., "Program MEG1600 User's Guide - CADD System - CANMET Systems for mineral reserve evaluation, Version I"; Division Report ERP/MRL 82-99(TR), CANMET, Energy, Mines and Resources Canada; 1982.

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